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## OBSERVATIONS ON THE ECOLOGY OF INDIAN GIANT SQUIRREL (*Ratufa indica*) IN SALIM ALI BIRD SANCTUARY, THATTEKKAD, KERALA

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### Abstract

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Indian Giant Squirrel (*Ratufa indica*) is endemic to India and is widely distributed in Peninsular India from the Evergreen to moist and dry deciduous forest of Western Ghats and Eastern Ghats and Central Indian Hills. The present study conducted in the human inhabited area of Salim Ali Bird Sanctuary, Thattekkad, Kerala focus on certain aspects of *Ratufa indica* and the study result revealed that *Cocos nucifera* formed the major contributor in their diet followed by others. False nesting behaviour was exhibited by the squirrel to ensure protection from predators and other climatic factors.

**Keywords:** Indian Giant Squirrel, *Ratufa indica*, false-nesting

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### Introduction

*Ratufa indica*, Indian giant squirrel is endemic to India and is widely distributed in Peninsular India, from the evergreen to moist and dry deciduous forest of Western Ghats and Eastern Ghats and Central Indian hills (Abdulali and Daniel (1952), Agarwal and Chakraborty (1979), Corbet and Hill (1992), Ramachandran (1992) and Molur *et al.*, (2005). It is a diurnal and arboreal species occurring in tropical evergreen, semi-evergreen and moist deciduous forests. *Ratufa indica* constitute an important component of the animal biomass

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of tropical rain forests and play an important role in seed dispersal and predation of several plants (Eisenberg 1980). Indian giant squirrel is listed as least concern by IUCN Red list because of its wide distribution, presumed large population and occurrence in a number of protected areas. It is widely distributed, but occurs in severely fragmented populations (Molur *et.al.*, 2005)

Indian Giant squirrel is one of the striking mammal species found in the sanctuary belonging to single genus *Ratufa*. Abdulali & Daniel (1952) reported eight colour forms of this taxon from its range in India. Ellerman (1961) listed five subspecies in India – *Ratufa indica indica* (Erxleben 1777), *Ratufa indica superans* (Ryley 1913), *Ratufa indica bengalensis* (Blanford 1897), *Ratufa indica centralis* (Ryley 1913) and *Ratufa indica maxima* (Schreber 1784). Corbet and Hill (1992) recognised four subspecies including *Ratufa indica dealbata* (Blanford 1897), a pale coloured population from Gujarat.

The subspecies of Indian giant squirrel reported from Salim Ali Bird Sanctuary, Thattekkad area is *Ratufa indica indica*. Nowadays, the number of this species is decreasing due to the paucity of suitable food and nest plant species both in terms of diversity and richness arising out of loss of habitat and excess anthropogenic pressure (Anon 2003).

### **Study area**

The study habitat is Salim Ali Bird Sanctuary, Thattekkad located at a latitude 76<sup>o</sup>40'-76<sup>o</sup>45'N and longitude 10<sup>o</sup>7'-11<sup>o</sup>E. The bird sanctuary is located in Kothamangalam taluk of Ernakulam district on the Northern banks of Periyar river and is a home to some of the rarest and endangered species of birds in India. Salim Ali Bird Sanctuary is the first bird sanctuary in Kerala, which covers an area of 25 square kilometer and the name "Thattekkad" literally

means flat forest and the region is an evergreen lowland forest located between the branches of Periyar river, the longest river in Kerala.

The study area selected for the present study is inhabited land area within the Salim Ali bird sanctuary, cultivated with diverse kinds of crops, spread in around 9 kms. Four plots of three hectares were selected each with different cultivated crops.

### **Methodology**

Direct observation and line-transect methods were involved and observations were made once in a week in the morning hours (8am -10am) for 18months (August 2014-January 2016) in four randomly selected plots (plots I-IV). These plots were having different cultivations like nutmeg, cocoa, papaya, guava, mango, jackfruit tree, coconut, pepper, etc.

### **Results and discussion**

Giant squirrels were noticed in the study area throughout the year. Maximum number of Giant squirrels was noticed in the area dominated by coconut, mango and jack fruit tree cultivation (Plots I & II). The Giant squirrels were not reported from plot III as the area was surrounded by water body. This species was rarely observed in Plot IV i.e, they were obtained only during March and April months. The maximum number of squirrels was noticed in the month of July and from November to February (2015) (Figure 1). Naresh *et al.*, (2014) studied population density and distribution of the Indian giant squirrel in Srivilliputhur WLS, Tamilnadu and noticed that mean population density was  $6.9 \pm 2.9$  individuals /sq.km.



(a) *R. indica* in the Sanctuary habitat and (b) *R.indica* feeding on tender coconut

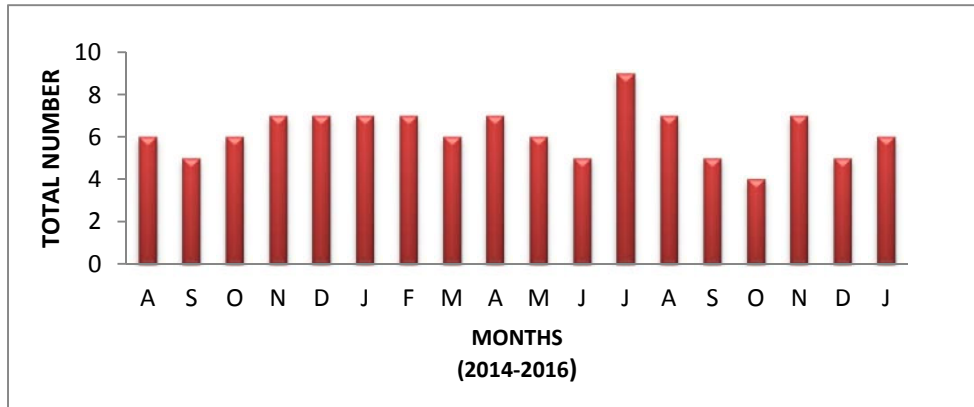


Figure 1. *R.indica* spotted in the study habitat during different months of the study period (2014-2016)

Plot I was having more coconut trees and squirrels were frequent visitors in the habitat and found feeding on the tender coconuts and suck liquid endosperm and the soft kernel. When they feed, a loud biting (gnawing) sound was produced, which one can easily hear and notice from a distance. A number of birds were noticed feeding on the leftover remnants of tender coconuts. A tremendous reduction in the coconut production was noticed in the study area as reported by the local farmers (figure 2).





**Figure 2. Tender *Cocos nucifera* (coconut) consumed by *Ratufa indica***

Among the food items consumed, *Cocos nucifera* (coconut) was the most significant contributor to the overall diet of Indian giant squirrel constituting 50% followed by *Artocarpus heterophyllus* (15%), *Artocarpus hirsutus* (13%), *Mangifera indica* (12%), *Tamarindus indica* (4%), followed by leaves and flowers (3%) and bark (2%) and others (1%). The study reveals that *Cocos nucifera* (tender coconut) forms the major preferred diet in the habitat, but its less-availability makes the species to select and rely on other food items like *A.hetrophyllus*, *A.hirsutus* and *M.indica*, which were seasonal and the absence of these food materials force them to feed on leaves, flowers and even bark and insects.

Nayak and Patr (2015) found that *Terminalia tomentosa* was the most significant contributor to the overall diet constituting 20.04% followed by *Tamarindus indica* (17.11%), *Manifera indica* (13.1%) and *Terminalia bellerica* (7.82%) respectively in Kuldila WLS, Odisha. Rout and Swain (2005) studied status of Giant Squirrel in Simlipal Tiger Reserve, Orissa and the study revealed that squirrels preferred more the petiole of leaf followed by fruits and bark of tree as their food in all the months of year.

Baskaran *et al.* (2011) studied the daylight activity and feeding patterns of giant squirrels and revealed that these animals feed and rest equal amounts of time and the diet constitute seeds, bark, petioles, leaves and fruits of which *Tectona grandis* make the principal food source (40%).

Malabar giant squirrels make large globular nests of twigs and leaves at the top of trees like *Tectona grandis*, *Hevea basiliensis*, *Garcinia cambogia* etc. A peculiar type of nesting known as “False nesting” was noticed in the habitat (5 nests) by which they make many nests in the same territory (figure 3). Of these, only one nest will be used as a nursery while others were merely made to confuse the predators to maximise the security. Bonnet Macaque were sighted in the residential area of the sanctuary and they may cause damage to the nests. This may be one of the reasons for the construction of multiple nests.

Pradhan *et al.*, (2012) reported the occurrence of multiple nests of Indian giant squirrels and noticed that the phenomenon might be either to escape from predators like Langur and Bonnet Macaque or to provide protection from climatic factors like temperature, cold and rain. Nests were very often found at the highest point on the tree that offered a maximum security and protection to the animal.



**Figure 3. Nest of *Ratufa indica***

According to Kanoje (2008), the most common nesting trees in Sitanadi WLS were *T.tomentosa* and *Schleichera oleosa*, which supported 14.73% and 13.39% of the nests respectively. Prater (1971) recorded that Giant squirrels are known to build nests in several trees, sometimes even within a small area.

## Conclusion

Giant squirrels mostly feed on seeds, fruits, barks etc. as reported elsewhere. In the present study, It was noticed that tender coconuts formed the major food item in the diet of these species in the residential area of Salim Ali bird sanctuary, Thattekkad. The consumption and destruction of tender coconuts at tremendous rate cause economic loss to local farmers. As tender coconuts were not available inside the forest area, the population there depend on other food items. The non- availability of the traditional food items like fruits and seeds might have forced these animals to consume the tender coconuts. Planting of more fruit trees along the forest fringes may attract these mammals to the forest habitat and would be an overwhelming effect for the farmers concerned.

## Acknowledgement

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**A COMPARISON OF DIVERISTY AND DISTRIBUTION OF  
FAMILY EULOPHIDAE IN THRISSUR AND PALAKKAD  
DISTRICTS OF KERALA AND ITS STATUS IN DNA  
BARCODING**

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**Abstract**

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Chalcidoid wasps are potential bio control agents. They are ubiquitous and are found rice ecosystem also. Coming under order Hymenoptera and superfamily Chacidoidea, the Family Eulophidae play a major role in controlling several insect pests. The present study focuses on comparison of diversity of the family associated with rice ecosystem. Sixteen species have been identified from Thrissur and Palakkad districts. A dichotomous key to species have been provided.

**Keywords:** Chacidoidea, Eulophidae, rice, diversity

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**Introduction**

The Chalcidoid parasitoids play a vital role in checking excessive increase of many pests of agricultural importance. The family Eulophidae (Chalcidoidea) associated with rice ecosystem has received relatively little attention. Hence, to know the possible role of each species of Eulophidae, the proposed study was conducted. The classification of the Eulophidae has recently been revised by Gauthier et al., (2000). The family worldwide includes 297 genera and 447 species placed in 4 subfamilies - viz., Entedoninae,

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Euderinae, Eulophinae and Tetrastichinae. Distribution of all species in the family is cosmopolitan. The Eulophidae is the largest family of Chalcidoidea and they are probably the most commonly collected members of the superfamily in all geographic realms.

### **Objectives**

Systematics of Eulophidae is poorly studied especially in Thrissur and Palakkad. In this study, an effort has been made to study Eulophids associated with rice ecosystem of Palakkad and Thrissur districts. Along with this, comparative analysis of the species from two districts has been plotted.

### **Methodology**

The analysis was done on the paddy fields at different crop ages in the two districts viz., Thrissur and Palakkad districts of Kerala. The collections were made using sweep net (2007-2009). The collection was done in the field mostly before emergence of panicle. Specimens after identification (Gibson 1997) are deposited in the following institutions: Zoological Survey of India (ZSI) and Department of Zoology, Calicut University (DZCU).

### **Results and discussion**

Eleven species belonging to the family Eulophinae was collected from reported from Thrissur district and five species in Palakkad. The genera *Elasmus*, *Aprostocerus*, *Chrysonotomyia*, *Closterocerus*, *Pediobius*, *Neomestocharella* and *Stenomesus* were collected. Thrissur recorded the maximum number of Eulophidae compared to Palakkad (figure 1 & 2). Sweeps made in rice field after harvest showed relatively less occurrence of natural enemies, possibly as the parasitoids might have migrated to nearby shrubs or herbs.



**Table 1. Species of Eulophidae collected from districts of Thrissur and Palakkad during the study period**

Species	Thrissur	Palakkad
<i>Aprostocetus benazeer</i>	1	1
<i>Aprostocetus malcis</i>	1	1
<i>Aprostocetus harithus</i>	1	2
<i>Chrysonotymia</i>	1	0
<i>Closterocerus</i>	0	1
<i>Stenomesus japonicus</i>	1	0
<i>Pediobius inexpectatus</i>	1	0
<i>Pediobius SP1</i>	0	3
<i>Neomestocharella keralensis</i>	1	0
<i>Tetrastichus howardi</i>	1	0
<i>Tetrastichus krishneri</i>	1	1
<i>Tetrastichus tunicus</i>	1	0
<i>Tetrastichus gireeshi</i>	2	1
<i>Tetrastichus schoenobi</i>	1	0
<i>Tetrastichus triozaai</i>	0	2
<i>Elasmus kollimalainus</i>	1	0

### Key to Species of Eulophidae Associated with Rice Ecosystem in Thrissur And Palakkad Districts

1. Axillae strongly and angulately advanced anteriorly along hind portion of the straight notauli; SMV interrupted at parastigma; PMV mostly wanting ..... 2
- = Axillae not strongly and angulately advanced, if approaching that condition, then SMV usually continuous with parastigma or anterior pair of setae of scutellum situated in anterior third ..... 13

- 2.(1) Pronotum with a cross carina; clava with a apical spine or spicule; mesosoma pale brownish yellow with metallic green patches .....*Neomestocharella keralensis* Narendran & Fousi  
 = Pronotum without a cross carina; mesosoma colour variable ..... 3
- 3.(2) SMV usually with more than 1 dorsal seta; propodeum without ‘Y’ shaped paraspircular carinae .....4  
 = SMV usually with a single dorsal seta; propodeum with “Y” shaped praspircular carina on each side ..... 6
- 4.(3) Scape as long as eyes, eyes pubescent ,ML distinct on posterior half, faint on anterior half; body dark metallic green; mesoscutum with 2 pairs of adnotaular setae on either side ;propodeum with a short median carina; rim of spiracle covered by callus, almost touching posterior margin ;surface smooth and shiny ;gaster sessile ,tergites moderately reticulate, shiny ,moderately pubescent on side; one cercal seta longer than others on either sides.....*Aprostocetus harithus* Narendran  
 = Scape little shorter than eye; eyes bare; spiracle separated from posterior margin of metanotum; other characters partly or completely different .....5.
- 5.(4) Mesonotum with 4 adnotaular rows of setae on either sides,propodeum with median carina spiracle separated from posterior margin of metanotum by less than half of its diameter; SMV with 5 dorsal setae; body brownish black; ML absent.....*Aprostocetus benazeer* Narendran  
 = Mesonotum with one row of 6 adnotaular setae on each side; propodeum separated from posterior with short median carinae, spiracle separated from posterior margin of metanotum by half its diameter; SMV with 4 stout dorsal setae ,ML present but weak ;head and mesosoma yellow.....*Aprostocetus malcis* Narendran

- 6(3) Antenna with 2 anellus, body shiny green; legs yellow except for greenish base of forecoxa and dark green or dark brown greater part of hind coxa; ocelli surrounded by a groove (often weak) ..... *Tetrastichus schoenobii* Ferriere  
 = Antennae with one anellus, other characters not as above.....7
7. (6) SMV with one dorsal setae.....8  
 = SMV with two dorsal setae.....9
- 8.(7) Gaster shorter than mesosoma, head and body black with metallic green or bluish reflection, coxae and femora black or dark brown with apices of femora pale..... *Tetrastichus gireeshi* Narendran  
 = Gaster distinctly longer than mesosoma..... 10
- 9.(7) F1 shorter than F2; mesoscutum with less than 6 adnotaular setae .....11  
 = F1 not shorter than F2; mesoscutum with 6 adnotaular setae ..... *Tetrastichus triozei* Khan et al
- 10.(9) Mesoscutum with 3 adnotaular setae on each side; space between submedian lines of scutellum 1.3x as long as wide ..... *Tetrastichus krishnaihi* Saraswat  
 = Mesoscutum with 4 adnotaular setae on either side; space between submedian lines of scutellum 2.09x as long as broad ..... *Tetrastichus tunicus* Narendran
- 11(9) Body black or brown with no metallic luster; propodeum reticulate rugose; clava much wider than funicular segments ..... *Tetrastichus howardi* Olliff

- = Body metallic green or blue, hind coxa concolorous with mesosoma; propodeum finely rugose; clava not much wider than funicular segments  
.....*Tetrastichus krishnieri* Mani
- 12(1) Propodeum with “H” shaped median carina; lateral grooves of scutellum meeting each other through posterior margin  
.....*Stenomesus japonicus* Ashmead
- = Propodeum without “H”shaped median carina; scutellum not as above  
.....13
- 13(12) Hind coxa wedge shaped, flat from sides, hind tibia with diamond shaped setal pattern (some times not diamond shaped but longitudinally elongated).....*Iasmus kollimalaianus* Mani& Saraswat
- = Characters not as above.....14
- 14(13) Propodeum with strong plicae.....15
- = Propodeum without conspicuous plicae laterally .....16
- 15(14) Forewing with 2 distinct hair lines proceeding distad from STV; antennal segments often compressed from sides.....  
*Clostocerus* sp.
- = Forewing at most with a single hairline from STV; antenna not compressed .....*Chrysonotomyia* sp
- 16(14) Body with metallic luster; head ,mesosoma and metasoma black ; Length 2mm;legs black ;scrobe not reaching anterior ocellus, ocelli large, POL a little longer than OOL; Propodeum with a median furrow containing double longitudinal rows of pits.....*Pediobius neoacantha* sp.nov

== Body green with bronzy reflection ,head and mesosoma metallic green ocelli in acute triangle;propodeum having submedian carinae close together at base which is rather weakly though quite distinctly diverging for about two-thirds their length , then more strongly so and with no distinct median carina between them .....*Pediobius inexpectatus* Kerrich

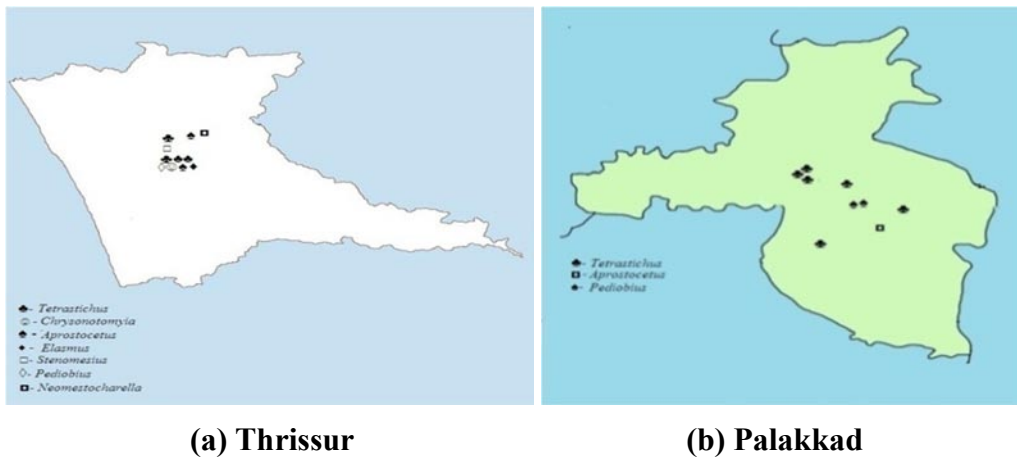


Figure 1. Distribution map of Thrissur and Palakkad districts showing species coming under Eulophidae

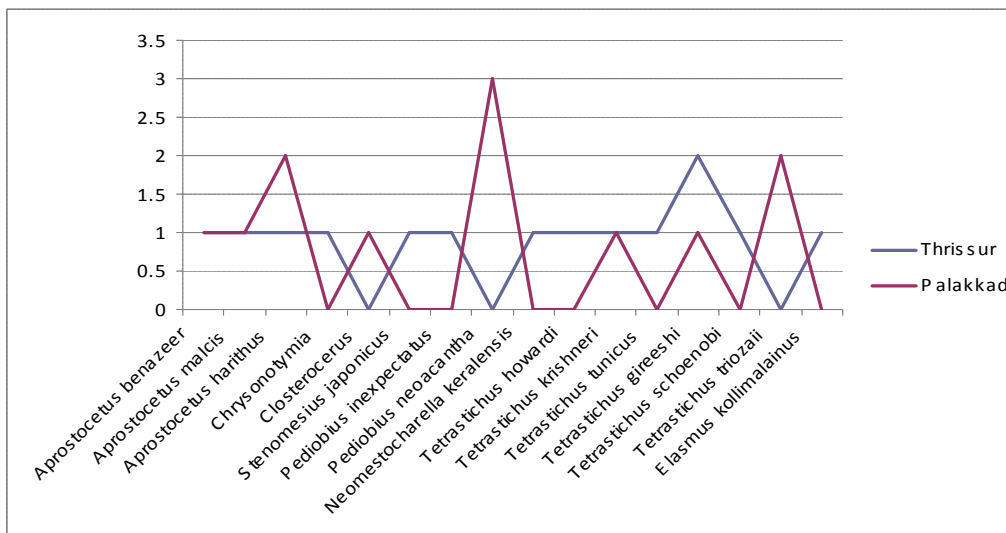


Figure 2. Abundance of Eulophidae in Thrissur and Palakkad districts

## Conclusion

The present study helped in providing information about the different species of Eulophids present in rice ecosystem of the two districts. There were 11 species reported from Thrissur while 5 species were reported from Palakkad. The distribution map and graphs show the diversity of the insects in rice ecosystem. The population of parasitoids was found to decrease with increased use of pesticides.

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## മോഹിനിയാട്ടം : പഴമയും പുതുമയും

സിഷ എസ്.\*

ഗവേഷക, മലയാളവിഭാഗം, ശ്രീ ശങ്കരാചാര്യ സംസ്കൃത സർവ്വകലാശാല, കാലടി.

### സംഗ്രഹം

കേരളത്തിലെ ഒരേയൊരു ശാസ്ത്രീയ സ്ത്രീനൃത്തകലയായിട്ടാണ് മോഹിനിയാട്ടം അറിയപ്പെടുന്നത്. ഏതൊരു കലാരൂപവും കാലത്തിലൂടെ കടന്നുപോകുമ്പോൾ പലവിധ മാറ്റങ്ങൾക്കും വിധേയമാകാറുണ്ട്. മോഹിനിയാട്ടം എന്ന നൃത്തകലയും ഇന്ന് നവനവങ്ങളായ പരീക്ഷണങ്ങൾക്ക് സാക്ഷ്യം വഹിക്കുന്നു. നൂറ്റാണ്ടുകൾ പഴക്കമുള്ള ഇത്തരം ക്ലാസിക്കൽ കലകളിൽ തിരുത്തലുകൾ / പരീക്ഷണങ്ങൾ നടത്തുക എന്നത് വെല്ലുവിളി തന്നെയാണ്. ചെറിയ മാറ്റങ്ങൾ പോലും പാരമ്പര്യവാദികളെ ചൊടിപ്പിച്ചേക്കാം. എന്നാൽ എല്ലാറ്റിനും നൈരന്തര്യമുണ്ട്. ഇതംഗീകരിച്ചാൽ മോഹിനിയാട്ടം ഇന്ന് പരീക്ഷണഘട്ടത്തിലൂടെ കടന്നുപോവുകയാണെന്ന് പറയേണ്ടിവരും. തിരുവിതാംകൂർ രാജാക്കന്മാർ മുതലിങ്ങോട്ട് മോഹിനിയാട്ടത്തിന്റെ പരിഷ്കരണശ്രമങ്ങൾ ആരംഭിക്കുകയാണ്. കലാമണ്ഡലത്തിന്റെ ഇടപെടലുകൾ സവിശേഷം ശ്രദ്ധേയമാണ്. തുടർന്നിങ്ങോട്ട് ഒറ്റയൊറ്റ കലാപരിശ്രമങ്ങളുടെ ചിന്താഫലങ്ങൾ കൂടി ഈ കലാരൂപത്തിന് പുതുമകൾ സമ്മാനിക്കുന്നു. അത്തരത്തിൽ മോഹിനിയാട്ടത്തിലെ പുത്തൻ പ്രവണതകളെ വിലയിരുത്തുന്ന ഒരു ലഘു പ്രബന്ധമാണിത്.

### താക്കോൽ വാക്കുകൾ

ക്ലാസിക്കൽ, സുകുമാരന്യത്തം, കളരി, ലാസ്യം, ജനകീയം, ജെൻഡർ.

### ആമുഖം

ശോഭകലർന്ന ഒരു സുകുമാരന്യത്തമാണ് മോഹിനിയാട്ടം. കേരളത്തിലെ ക്ഷേത്രകേന്ദ്രീകൃതവ്യവസ്ഥിതിയുടെ അനന്തരഫലങ്ങളിലൊന്നാണ് മോഹിനിയാട്ടം എന്ന കലാരൂപം. ക്ഷേത്രത്തിലെ നിത്യനിദാനം നിർവ്വഹിക്കുന്നവരിൽ സ്ത്രീകൾ വഹിച്ചിരുന്നതാണ് ദേവരാസി സ്ഥാനവും കുത്തച്ചിയും. അവർ ആടിയിരുന്ന കലാപ്രകടനമാണ് മോഹിനിയാട്ടം. എല്ലാ കല

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കൾക്കും പാരസ്പര്യമുണ്ട്. മോഹനിയാട്ടത്തിന്റെ സ്വത്വനിർമ്മിതിയിൽ പങ്കുവഹിച്ച ഇതര നൃത്തരൂപങ്ങളെ പരാമർശിക്കാതെ കടന്നുപോകാനാവില്ല. സംഘകാലത്ത് തമിഴകത്തുണ്ടായിരുന്ന പ്രാദേശികനൃത്തരൂപങ്ങളുടെയൊക്കെ സ്വാധീനം മോഹനിയാട്ടത്തിനുണ്ട്. പാണ്ഡ്യ രാജധാനിയുമായുള്ള സമ്പർക്കത്തിന്റെ ഫലമായിട്ടായിരിക്കാം കേരളത്തിൽ മോഹനിയാട്ടം നടപ്പിലായതെന്ന് കെ.ആർ. പിഷാരടി നിരീക്ഷിക്കുന്നുണ്ട്. ഇന്ന് ഈ കലാരൂപത്തിന് ദാർശനികത്തിലാകമാനം നർത്തകവൃന്ദമുണ്ട്. ലോകകലാഭൂപടത്തിൽ കേരളത്തിന്റെ മോഹനിയാട്ടം പുതുമകളോടെ നിലനിൽക്കുന്നു.

**മോഹനിയാട്ടത്തിലെ പുതുമകൾ**

മോഹനിയാട്ടത്തിന്റെ പരിഷ്കരണശ്രമങ്ങളിൽ തിരുവിതാംകൂർ രാജാക്കന്മാർ വഹിച്ച പങ്ക് ചെറുതല്ല. സ്വാതിതിരുന്നാളാണ് ദാസിയാട്ടത്തിന് മോഹിനയാട്ടം എന്ന് പേരിട്ടത്. അദ്ദേഹം ദരതനാട്ടുവുമായി അതിനെ ബന്ധിപ്പിക്കുകയും ചെയ്തു. സ്വാതിയുടെയും ഇരയിമ്മൻതമ്പിയുടെയും കൃതികൾ മോഹിനയാട്ടാവതരണത്തെ സ്വാധീനിച്ചിട്ടുണ്ട്. ഭക്തിശൃംഗാരരസം സ്വാതിയുടെ സംഭാവനയാണ്. അദ്ദേഹം തഞ്ചാവൂർ സഹോദരന്മാരെ വരുത്തി നിരവധി നർത്തകിമാർക്ക് മോഹിനയാട്ടം അഭ്യസനം നൽകി. അദ്ദേഹത്തിന്റെ ശ്രമഫലമായി കർണ്ണാടക സംഗീതത്തിന്റെ സ്വാധീനം മോഹിനയാട്ടത്തിന് പുതുശോഭയേകി.

മോഹിനയാട്ടം ഏറെ കാലത്തിനുശേഷം ഭദ്രമായ ഒരു രൂപം കൊണ്ടെടുത്തത് കലാമണ്ഡലത്തിൽ നിന്നാണ്. 1930 ൽ മഹാകവി വള്ളത്തോളിന്റെയും മുകുന്ദരാജാവിന്റെയും ശ്രമത്തോടുകൂടി കേരളകലാമണ്ഡലം രൂപംകൊണ്ടു. 1930 കൾക്കുശേഷം മോഹിനയാട്ടത്തിലെ പരിഷ്കരണവും തുടങ്ങുകയായി. ഒരു നൃത്താവിഷ്കാരം ധനസമ്പാദനാർത്ഥമായി മാറുന്നത് എങ്ങനെയെന്നത് മോഹിനയാട്ട ചരിത്രം നോക്കിയാൽ വ്യക്തമാകും. കളഭക്കൂത്ത്, മൂക്കുത്തിപ്പാട്ട്, പൊലിക്കൂത്ത്, അച്ചിക്കൂത്തുപാട്ടുകൾ, ഏശൽ, വ്യാലും പുല്ലാംഗിയും എന്നീ പേരുകളിൽ അശ്ശിലച്ചുവയുള്ള ചുവടുകൾ അടങ്ങിയ മോഹിനയാട്ട നൃത്താവിഷ്കാരത്തിന്റെ ആദാസ നിലയ്ക്ക് എതിരായാണ് കലാമണ്ഡലത്തിലെ പരിഷ്കരണശ്രമങ്ങൾ നടക്കുന്നത്. റീജൻ്റ് സേതുലക്ഷ്മിദായി ദാസിയാട്ടം നിരോധിക്കുകയും ചെയ്തു.

1935നു- ശേഷംകല്യാണിക്കുട്ടിയമ്മ കലാമണ്ഡലത്തിൽ വിദ്യാർത്ഥിനിയായി വന്നപ്പോൾ പഠിച്ചിരുന്നത് കഥകളി നൃത്തമായിരുന്നു. കണ്ടെത്തുവളപ്പിൽ മാധവിയമ്മ അദ്ധ്യാപികയായി വന്നപ്പോൾ മോഹിനയാട്ടക്കളരി വീണ്ടും തുടങ്ങി. 1950 ൽ വള്ളത്തോൾ ചിന്നമ്മുഅമ്മ എന്ന

പയ്യന്നൂർക്കാരിയായ കലാകാരിയെ കണ്ടെത്തുന്നു. അവർ ശ്രീ. കലമൊഴി കൃഷ്ണമേനോന്റെ ശിഷ്യയായിരുന്നു. 1950 ൽ തോട്ടശ്ശേരി ചിന്നമ്മുവമ്മ അദ്ധ്യാപികയായി കലാമണ്ഡലത്തിൽ ചേരുന്നു. അക്കാലത്ത് വള്ളത്തോളിന്റെ നിബന്ധനകളും നിർദ്ദേശങ്ങളും പ്രകാരം മോഹിനി യാട്ടത്തിൽ ചില പരിഷ്കാരങ്ങൾ വരുത്തി. പക്കമേളക്കാർക്ക് രംഗത്ത് വലതുഭാഗത്ത് സ്ഥാനം നൽകി. മുദംഗം ഏർപ്പെടുത്തി. ആദ്യകാലത്ത് സോപാനരീതിയിലുള്ള വായ്പ്പാട്ടും, തൊപ്പിമദ്ദളം, തിത്തി തുടങ്ങിയ കേരളീയ താളങ്ങളുമാണ് മോഹിനിയാട്ടത്തിന് പശ്ചാത്തലം ഒരുക്കിയിരുന്നത്. എന്നാൽ ഇന്ന് അതിന്റെ സ്ഥാനത്ത് കർണ്ണാടക സംഗീതവും, മുദംഗം, വയലിൻ, കൈമണി തുടങ്ങിയ വാദ്യങ്ങളാണ് ഉപയോഗിച്ചുവരുന്നത്.

മോഹിനിയാട്ടത്തിന് നിരവധി ശൈലികളുണ്ട്. ശൈലിഭേദങ്ങളുണ്ടെങ്കിലും ലാസ്യമെന്ന പ്രധാന അംശത്തെ അത് നിലനിർത്തുന്നുണ്ട്. കലാമണ്ഡലത്തിൽ നിന്നുതന്നെ ആദ്യം ഉരിത്തിരിഞ്ഞ രണ്ട് ശൈലികളാണ് കൃഷ്ണപ്പണിക്കരാശാന്റെ കീഴിൽ പരിശീലനം നേടിയ കലാമണ്ഡലം കല്യാണിക്കുട്ടിയമ്മയുടെയും തോട്ടശ്ശേരി ചിന്നമ്മുവമ്മയുടെയും കീഴിൽ ശിക്ഷണം നേടിയ കലാമണ്ഡലം സത്യഭാമയുടെയും രീതികൾ. കലാമണ്ഡലം സത്യഭാമയുടെ കീഴിൽ പിന്നീട് കലാമണ്ഡലത്തിൽ പരിശീലനം നേടിയവരാണ് കലാമണ്ഡലംശൈലി പിൻതുടരുന്നവർ.

ആദ്യകാലത്ത് മോഹിനിയാട്ടത്തിൽ തീവ്രമായ ഭാവങ്ങളുള്ള (രൗദ്രം, വീരം) കഥാപാത്രങ്ങൾ അവതരിപ്പിക്കാറില്ല. ലാസ്യത്തിന് ഭംഗം വരും എന്ന മിഥ്യാധാരണയാണ് ഇതിന് കാരണം. എന്നാൽ ഇന്ന് വിളംബകാലത്തിൽ മാത്രമല്ല; ചലനസമ്പ്രദായത്തിലും, ഭക്തി ശൃംഗാരതര രസാവിഷ്കാരത്തിലും ലാസ്യത്തിന് നിലനിൽപ്പുണ്ട് എന്ന് പ്രയോഗ പരിചയത്തിലൂടെ തെളിഞ്ഞിരിക്കുന്നു. വിളംബത്തിൽ ആരംഭിച്ച് ദ്രുതഗതിയിലാകുമ്പോൾ വിളംബകാലത്തിൽ അവതരിപ്പിക്കുന്ന നിഷ്കർഷകൾ ദ്രുതഗതിയിലും പാലിക്കാൻ പറ്റുകയാണെങ്കിൽ ലാസ്യത്തിന് ഭംഗമില്ല. തീവ്രഭാവങ്ങൾ അവതരിപ്പിക്കുമ്പോൾ വാചികത്തിലും വാദ്യോപകരണങ്ങളുടെ തീവ്രതകൂട്ടിയും ഭാവത്തെ സ്പർശിപ്പിക്കാം. സംഘകാല കൃതിയായ കണ്ണകി ഇത്തരത്തിൽ തീവ്രഭാവം അവതരിപ്പിച്ച് ഫലിപ്പിച്ച മോഹിനിയാട്ടാവതരണമാണ്.

മോഹിനിയാട്ടം ഇന്ന് ക്ലാസിക് പരിവേഷം വിട്ട് ജനകീയമായി മാറിയിരിക്കുന്നു. അതോടെ, കവിതകൾ, സംഘവൽക്കരണം തുടങ്ങിയവ വിജയപ്രദമായി നടപ്പിലായി. മോഹിനിയാട്ട നർത്തകിയായ വിനിതാ നെടുങ്ങാടി മലയാളം കവിതകളുടെ രംഗാവിഷ്കാരം മനോഹരമായി

നടത്തുന്നു. കാവാലത്തിന്റെ കറുകനെ കാർമുകിൽ, ഇടശ്ശേരിയുടെ പുതപ്പാട്ട്, ടാഗോറിന്റെ ഗീതാഞ്ജലി പരിഭാഷ എന്നിവ ഇതിനുദാഹരണമാണ്. കലാമണ്ഡലം ക്ഷേമാവതി, മേതിൽ ദേവിക, നീമാ പ്രസാദ് ഉൾപ്പെടെ നിരവധി കലാകാരികൾ നിരന്തരം പരിഷ്കരണ ശ്രമങ്ങൾ നടത്തുന്നുണ്ട്. കലാമണ്ഡലം ക്ഷേമാവതി ധാരാളം കവിതകൾക്ക് രംഗഭാഷ്യം നൽകിയിട്ടുണ്ട്. ആശാൻ കൃതികൾ, സുഗതകുമാരി കവിതകൾ എന്നിവ മികച്ച ദൃശ്യവിരുന്നാണ്. ഇത്തരം പരിക്ഷണങ്ങൾ നടത്തുമ്പോൾ തനിക്ക് നേരിടേണ്ടിവന്ന അനുകൂലവും പ്രതികൂലവുമായ സാഹചര്യങ്ങളെ അവർ അഭിമുഖങ്ങളിൽ വെളിപ്പെടുത്തിയിട്ടുണ്ട്. മോഹിനിയാട്ടം ഇന്ന് ഡാൻസ് ഡ്രാമ എന്ന നിലയിലും അവതരണ സജ്ജമാണ്.

കലകൾക്ക് 'ജെൻഡർ' അതിർവരമ്പുകൾ നൽകാൻ സാധിക്കില്ല എന്നതിന് തെളിവാണ് ഇന്ന് മോഹിനിയാട്ട അവതരണത്തിൽ ജോളി മാത്യു എന്ന കലാകാരൻ. അദ്ദേഹം തൃപ്പൂണിത്തുറ ആർ.എൽ.വി. കോളേജിൽ നിന്ന് മോഹിനിയാട്ടം റാങ്കോടെ പഠിച്ചിറങ്ങി. ദർശ്യഹരിയുടെ ജീവിതത്തെ മുൻനിർത്തിയുള്ള മോഹിനിയാട്ടം ഡ്രാൻസ് ഡ്രാമ എന്ന രീതിയിൽ ഇരുപതോളം നർത്തകർ അവതരിപ്പിച്ചു. ഈ അവതരണത്തോടെ കേരളത്തിലെ ശാസ്ത്രീയ സ്ത്രീ നൃത്തകല എന്ന പ്രയോഗം ഇനി തിരുത്തിക്കുറിക്കേണ്ടതുണ്ട്. ഇത്തരത്തിൽ നവനവങ്ങളായ പുതുമകളിലൂടെ കാലത്തിലൂടെ നിരന്തരം ചലിക്കുകയാണ് മോഹിനിയാട്ടം എന്ന കലാരൂപം.

**ഉപസംഹാരം**

മോഹിനിയാട്ടം : പഴമയും പുതുമയും എന്ന ഈ ലഘുപ്രബന്ധത്തിൽ നിന്ന് ഉരുത്തിരിഞ്ഞ ആശയങ്ങളെ നിഗമനങ്ങളായി താഴെ കൊടുക്കുന്നു.

മോഹിനിയാട്ടം എന്ന ക്ലാസിക് കലയിൽ നിരവധിയായ നവോത്ഥാന ശ്രമങ്ങൾ നടന്നിട്ടുണ്ട്; നടക്കുന്നുമുണ്ട്.

കലകൾക്ക് തമ്മിൽ പാരസ്പര്യമുണ്ട്; ആ നിലയ്ക്ക് മോഹിനിയാട്ടം ഇതര കലാരൂപങ്ങളിൽ നിന്ന് കൊടുക്കൽ വാങ്ങലുകൾ നടത്തിയിട്ടുണ്ട്.

തിരുവിതാംകൂർ രാജാക്കന്മാരോടുകൂടിയ പരിഷ്കരണ ശ്രമങ്ങൾ കേരള കലാമണ്ഡലത്തിൽ പൂർണ്ണത കൈവരുന്നു.

ഒറ്റയൊറ്റ കലാപരിശ്രമികളുടെ ചിന്താഫലങ്ങളും ഇന്ന് മോഹിനിയാട്ടത്തെ ശോഭയുറ്റ താക്കുന്നു.

മോഹിനിയാട്ടം ഇന്ന് ക്ലാസിക് പരിവേഷം വിട്ട് ജനകീയമാവുകയാണ്. അതിൽ കവിതാ വിഷ്കാരം, ഡ്രാൻസ് ഡ്രാമ, സംഘവൽക്കരണം എന്നിവ പരീക്ഷിക്കുന്നു.

ശാസ്ത്രീയ സ്ത്രീനൃത്തകല എന്ന നിലമാറി നർത്തകരുടേതു കൂടിയാവുകയാണ് മോഹിനി യാട്ടം.

**ഗ്രന്ഥസൂചി**

കല്യാണിക്കുട്ടിയമ്മ	1992	മോഹിനിയാട്ടം : ചരിത്രവും ആട്ട പ്രകാരവും ഡി.സി. ബുക്സ്, കോട്ടയം
മിനി എ	2014	നവോത്ഥാനം ക്ലാസിക് കലകളിൽ, നാഷണൽ ബുക്സ് സ്റ്റാൾ, കോട്ടയം

**ലേഖനസൂചി :**

ശർമ്മ വി.എസ്.	മോഹിനിയാട്ടം, സംസ്കാര കേരളം, പുസ്തകം 47, 1998 ജൂലൈ
സോമൻ. പി.	ചരിത്രമില്ലാത്ത മോഹിനിയാട്ടം, ദാഷാപോഷിണി പുസ്തകം 18, ലക്കം 3, 1994 ആഗസ്റ്റ്

## അസ്തിത്വത്തിന്റെ അർത്ഥാന്തരങ്ങൾ

(കാക്കനാടന്റെ ഉഷ്ണമേഖലയെ മുൻനിർത്തി ഒരു പഠനം)

സിനു വർഗീസ് \*

ഗവേഷക, യു.സി. കോളേജ്

### സംഗ്രഹം

ആധുനിക മലയാള സാഹിത്യത്തിൽ പുതിയൊരു ശൈലിയുമായി കടന്നുവന്ന എഴുത്തുകാരനായിരുന്നു കാക്കനാടൻ. 1960കളുടെ ആരംഭത്തിലുണ്ടായ സാംസ്കാരിക രാഷ്ട്രീയ ചിന്താ വൈവിധ്യങ്ങൾ മനുഷ്യമനസ്സിന്റെ ഭയാശങ്കകൾ നിസ്സഹായത, മാനസിക സംഘർഷം, സന്ദിഗ്ധാവസ്ഥ തുടങ്ങിയവ ഈ കാലഘട്ടത്തിലെ കൃതികളിൽ പ്രതിഫലിച്ചിരുന്നു. ഉഷ്ണമേഖലയും ഇതിൽനിന്ന് വ്യത്യസ്തമല്ല. കാക്കനാടന്റെ ഏറ്റവുമധികം ചർച്ചചെയ്യപ്പെട്ടിട്ടുള്ള നോവലാണ് *ഉഷ്ണമേഖല*. ആധുനിക മനുഷ്യന്റെ പ്രതിനിധിയാണ് ഇവിടെ ശിവൻ. ആധുനിക മനുഷ്യന്റെ സംഘർഷവും മോഹഭംഗവും നിസ്സഹായതയും ഏകാന്തതയും നിസ്സംഗതയും എല്ലാ *ഉഷ്ണമേഖല*യിൽ അവതരിപ്പിക്കപ്പെടുന്നുണ്ട്. ഇപ്രകാരം അസ്തിത്വദർശനങ്ങൾ ഉഷ്ണമേഖലയെ എത്രമാത്രം സ്വാധീനിച്ചിട്ടുണ്ടെന്ന് അന്വേഷിക്കുകയാണ് ഈ പ്രബന്ധം.

### താക്കോൽവാക്കുകൾ

അസ്തിത്വം, നിഷേധം, പ്രത്യയശാസ്ത്രം, അന്വൽക്കരണം, സ്വത്വം

### ആമുഖം

മലയാള സാഹിത്യത്തിൽ യഥാതഥ പ്രസ്താനത്തിനും കാല്പനികപ്രസ്ഥാനത്തിനും ശേഷം ആയിരത്തി തൊള്ളായിരത്തി അറുപതുകളോടെയാണ് സമൂഹത്തിന്റെ സങ്കീർണ്ണതകളെ ആവിഷ്കരിച്ചുകൊണ്ട് ആധുനികത കടന്നുവന്നത്. പാശ്ചാത്യ രാജ്യങ്ങളിൽ ആധുനികതയുടെ ആവിർഭാവത്തിനു കാരണമായ സാഹചര്യങ്ങളിൽ നിന്നു വ്യത്യസ്തമായി കേരളീയമായ ചില സവിശേഷതകളാണ് ഇവിടെ ആധുനികതയുടെ കടന്നുവരവിനു കാരണമായത്. ഇന്ത്യക്ക് സ്വാതന്ത്ര്യം ലഭിച്ചിട്ടും തങ്ങളുടെ സ്വപ്നങ്ങൾ സഫലമാകാതിരുന്നതും മാർക്സിസ്റ്റ് പ്രത്യയശാസ്ത്രങ്ങൾ അപ്രസക്തമായി തീർന്നതും യുവജനങ്ങളെ നിരാശരാക്കി. ഇത്തരമൊരു

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സാമൂഹിക- രാഷ്ട്രീയ പരിസരത്തിൽ എഴുത്തുകാരും അവനവനെക്കുറിച്ചു ചിന്തിക്കുവാൻ നിർബന്ധിതരായി. ഈയൊരു സാഹചര്യത്തിലാണ് അസ്തിത്വദർശനം മലയാള എഴുത്തുകാരെ സ്വാധീനിച്ചത്. 60-70കളിൽ തൊഴിൽ തേടി നഗരങ്ങളിലേക്കുപോകാൻ നിർബന്ധിതരായ യുവാക്കൾക്ക് നഗരജീവിതവുമായി പൊരുത്തപ്പെടാൻ കഴിഞ്ഞില്ല. അനാഥത്വവും അന്യവൽക്കരണവും എല്ലാം അവരെ വേട്ടയാടി. ഈയൊരവസ്ഥയെ ഗൗരവമായി വീക്ഷിക്കുന്നതാണ് കാക്കനാടന്റെ കൃതികൾ.

1969-ലാണ് കാക്കനാടന്റെ *ഉഷ്ണമേഖല* എന്ന നോവൽ പുറത്തിറങ്ങിയത്. മനുഷ്യാസ്തിത്വം, മരണം, മരണം മുന്നിൽ കാണുന്ന വ്യക്തികളുടെ സദാചാരബോധം, നന്മ, തിന്മ ഇവയെല്ലാം കാക്കനാടന്റെ കൃതികളിലും കാണാം. സമൂഹ പശ്ചാത്തലത്തിൽ കഥ പറയുമ്പോഴും കഥാപാത്രങ്ങളെല്ലാം ഇവിടെ ഒറ്റപ്പെട്ടവരാണ്. ഒരു വ്യക്തി നേരിടുന്ന പ്രശ്നങ്ങളും അതിനെത്തുടർന്നുണ്ടാകുന്ന ശൂന്യതയും സംഘർഷങ്ങളും എല്ലാം ഇവിടെ വിഷയമാകുന്നു.

നാട്- നഗരം എന്നിങ്ങനെ രണ്ടുഭാഗമായാണ് നോവലിസ്റ്റ് ഈ കൃതിയെ തിരിച്ചിരിക്കുന്നത്. കമ്മ്യൂണിസ്റ്റ് പ്രസ്ഥാനങ്ങളുടെ ത്യാഗത്തിന്റെ കഥ ആദ്യഭാഗമായ 'നാട്' അനാവരണം ചെയ്യുന്നു. രണ്ടാം ഭാഗമായ 'നഗരം' അതേ പ്രസ്ഥാനത്തിന്റെ അപചയം വ്യക്തമാക്കുന്നു. നാട്-നഗരം എന്നീ രണ്ടവസ്ഥകളിൽ 'ശിവൻ' എന്ന കഥാപാത്രത്തിനു സംഭവിക്കുന്ന മാറ്റങ്ങളിലൂടെയാണ് നോവൽ കടന്നുപോകുന്നത്. കുടുംബബന്ധങ്ങളും സുഹൃത്ത് ബന്ധങ്ങളും കച്ചവടക്കണ്ണോടെ കാണുന്ന നഗര ജീവിതം മൂല്യങ്ങൾക്കും വികാരങ്ങൾക്കും യാതൊരു സ്ഥാനവും നല്കുന്നില്ല. കാപട്യവും കൃത്രിമവും നിറഞ്ഞ നാഗരികജീവിതത്തിൽ ഒറ്റപ്പെട്ടുപോകുന്ന വ്യക്തി, തനിക്ക് ആശ്രയിക്കാൻ ആരുമില്ല എന്ന യാഥാർത്ഥ്യം ഉൾക്കൊള്ളുന്നു. നഗരത്തിലെ തിരക്കുകൾക്കുള്ളിൽ സ്വന്തം മുഖം നഷ്ടപ്പെട്ട് അന്യനായി മാറുന്ന വ്യക്തിയുടെ / ശിവന്റെ മാനസിക വ്യഥകളും സംഘർഷങ്ങളുമാണ് ഇവിടെ വിഷയമാകുന്നത്. കുടുംബബന്ധങ്ങൾ ഒരു വ്യക്തിയെ നിഷ്ക്രിയനാക്കുന്നതും അവിടെ വ്യക്തിക്ക് തന്റേതായ സ്വത്വം നഷ്ടപ്പെടുന്നതും 'ശിവൻ' എന്ന കഥാപാത്രത്തെ മുൻനിർത്തി നോവലിസ്റ്റ് കാണിച്ചുതരുന്നു.

ജന്മിത്വത്തിനും അനീതിക്കും അക്രമത്തിനുമെതിരെ പോരാടിയ സഖാക്കളുടെ ഊർജ്ജം കൊണ്ട് ഉയർന്നുവന്ന കമ്മ്യൂണിസ്റ്റ് പ്രസ്ഥാനം പിന്നീട് പലതായി ചിതറപ്പെട്ട് നാമാവശേഷമായി. ശിവനെപ്പോലെയുള്ള ഉന്മാദികളും ദീഷ്മരൈപ്പോലെയെ സ്വയം പിന്മാറിയവരും

കരുണനൈപ്പോലെ ഇല്ലാതായവരും അതിലുൾപ്പെട്ടു. നാട്-നഗരം എന്നീ രണ്ട് ഭാഗങ്ങളിലൂടെ പ്രസ്ഥാനത്തിനുവന്ന കാലാനുസൃതമായ മാറ്റങ്ങൾ നമുക്ക് കാണുവാൻ കഴിയും. വ്യക്തമായ ലക്ഷ്യബോധത്തോടും സാമൂഹികബോധത്തോടും കൂടി ജീവിതം തുടങ്ങി അന്ത്യത്തിൽ ജീവിതം നിരർത്ഥകമാണെന്ന് തിരിച്ചറിഞ്ഞ വ്യക്തിയാണ് ശിവൻ. ഈ തിരിച്ചറിവ് സാമൂഹികബന്ധങ്ങളിൽ നിന്ന് അവരെ അകറ്റി ഏകാകികളും ലക്ഷ്യമില്ലാത്തവരുമാക്കിത്തീർക്കുന്നു. ജീവിതം ഒരു ഉഷ്ണമേഖലയാണെന്ന് ശിവൻ തന്റെ അനുഭവങ്ങളിലൂടെ മനസ്സിലാക്കുന്നു. ആശിച്ച രീതിയിലൊന്നും മുന്നോട്ടുപോകാൻ കഴിയാതെ തന്റെ സ്വത്വം തേടി അലയുന്ന ശിവനെ കഥാപാത്രത്തിന്റെ ജീവിതമാണ് ഈ നോവലിലെ ഇതിവൃത്തം. സജീവ പാർട്ടിപ്രവർത്തകനായിരുന്ന ശിവൻ അതിന്റെ പതനമോർത്തു ദുഃഖിക്കുന്നു. കുടുംബത്തെ രക്ഷിക്കുകയെന്ന ലക്ഷ്യവുമായി നഗരത്തിലെത്തിയിട്ടും അയാൾക്ക് സംതൃപ്തി ലഭിക്കുന്നില്ല. എല്ലാവരിൽ നിന്നും താൻ ഒറ്റപ്പെടുകയാണെന്ന് അവസാനം ശിവൻ മനസ്സിലാക്കുന്നു. “എനിക്ക് എന്നെത്തന്നെ നഷ്ടപ്പെട്ടിരിക്കുന്നു. ഈ ലക്ഷങ്ങളുടെ ഇടയിൽ ചികഞ്ഞെടുക്കാൻ വയ്യാത്ത ഒന്നായി ഞാൻ പെട്ടുപോയിരിക്കുന്നു. എനിക്ക് വ്യക്തിത്വമില്ല. ഒരു വ്യക്തിയുടേതായ പ്രത്യേകതകളില്ല. ഗുണങ്ങളും ദോഷങ്ങളുമില്ല. എന്റെ ഗുണങ്ങളും ദോഷങ്ങളും ഈ നഗരത്തിന്റേതാണ്. യാത്രികമായ ഈ നിലനില്പിന്റേതാണ്” (232).

നഗരത്തിൽ എത്തപ്പെട്ട ശിവൻ നഗരജീവിതത്തിന്റെ യാതൊരു വിധ പ്രലോഭനങ്ങൾക്കോ ആർഭാടങ്ങൾക്കോ വഴിപ്പെടുന്നില്ല. സ്വന്തം വ്യക്തിത്വം കാത്തുസൂക്ഷിച്ച് മുൻപോട്ടുപോകുമ്പോഴും ആശിച്ചതൊന്നും അയാൾക്ക് സഫലമാക്കാൻ കഴിയുന്നില്ല. “ഈ നഗരം എപ്പോഴും ഒഴിഞ്ഞുമാറിനിൽക്കുന്നു. ഈ നഗരത്തെ പരിചയപ്പെടാനിതുവരെ കഴിഞ്ഞിട്ടില്ല. ഇനി കഴിയുമെന്നും തോന്നുന്നില്ല. ഈ നഗരത്തിന്റെ ഭാഗമാകുവാൻ പറ്റില്ല. പറ്റുമെങ്കിൽ ഇതിനകം അതു സംഭവിക്കുമായിരുന്നു” (139). കുടുംബബന്ധങ്ങളുടെ പാവനതയോ മൂല്യബോധമോ ഒന്നും ആ നഗരസംസ്കാരത്തിൽ കണ്ടെത്താൻ ശിവനു കഴിയുന്നില്ല. സ്വന്തമായ ആദർശങ്ങൾ നഗരജീവിതത്തിന്റെ ആർഭാടങ്ങളിൽനിന്ന് ശിവനെ അകറ്റി നിർത്തുന്നു. നാഗരികവും യാത്രികവുമായ ജീവിതസാഹചര്യത്തിൽ എത്തിപ്പെടുന്ന ഒരു സാധാരണ മനുഷ്യന് അനുഭവിക്കേണ്ടിവരുന്ന അന്യതാബോധം ശിവനിൽ കാണാം. ലോകത്തോടുള്ള കടമയോ കുടുംബത്തോടുള്ള കടമയോ പാലിക്കപ്പെടേണ്ടത് എന്ന ചോദ്യം ശിവന്റെ മനസ്സിൽ എന്നും സംഘർഷം സൃഷ്ടിച്ചിരുന്നു. സമൂഹവുമായി പൊരുത്തപ്പെടാൻ കഴിയാതെ സ്വയം അന്യനായി ഒറ്റപ്പെട്ടവനായിത്തീരുന്ന വ്യക്തിയുടെ മുഖമാണ് ‘ശിവൻ’ എന്ന

കഥാപാത്രത്തിലൂടെ അവതരിപ്പിക്കുന്നത്. മറ്റുള്ളവരിൽ നിന്നും തന്നിൽനിന്നുതന്നെയും അന്യനായിത്തീരുന്ന കഥാപാത്രമാണ് 'ശിവൻ'. നഗരവൽക്കരണം മനുഷ്യൻ അവന്റെ സ്വാഭാവികമായ വേരുകൾ നഷ്ടപ്പെടുത്തി. തനിക്കാശ്രയിക്കാൻ താൻമാത്രമേയുള്ളൂ എന്ന ബോധം മനുഷ്യനെ വേട്ടയാടിയത് ഈ സാഹചര്യത്തിലാണ്. "നഗരവാസിയായ ഒരു യന്ത്രമനുഷ്യന്റെ അയമാർത്ഥമായ മുഖമാണ്" (144) തന്നേതെന്ന് ശിവൻ തിരിച്ചറിയുന്നു. ഇങ്ങനെ ആത്മനിന്ദയുടെയും ആത്മവിചാരണയുടെയും ഒരു ലോകത്തിലൂടെയാണ് ശിവന്റെ മനസ്സ് സഞ്ചരിക്കുന്നത്. "ധർമ്മസങ്കടങ്ങൾ മനുഷ്യന്റെ മാത്രം വിധിയാണ്. ഒരു കണക്കിനു നോക്കിയാൽ ആ വിധിയുടെ മുമ്പിൽ മനുഷ്യൻ നിസ്സഹായനാണ്. പക്ഷേ, മനുഷ്യന്റെ വലുപ്പങ്ങളെല്ലാം അവൻ സ്വായത്തമാക്കുന്നത് ഈ തീച്ചുളയിലൂടെ കടന്നുപോയിട്ടാണ് (51) എന്ന തോമസ് മാത്യുവിന്റെ നിരീക്ഷണം ഇതിനോട് ചേർത്തുവായിക്കാം.

കേരളത്തിൽ വളർന്നുവന്ന തൊഴിലില്ലായ്മ അനേകം ചെറുപ്പക്കാരെ വൻനഗരങ്ങളിൽ എത്തിച്ചു. നഗരങ്ങളിലെ യാന്ത്രികസംസ്കാരത്തിൽപ്പെട്ട് സ്നേഹത്തിന്റെ ഊഷ്മളത അവർക്കു നഷ്ടമാകുന്നു. അവർ ഏകാകികളായിത്തീരുന്നു. അവിടെയുള്ളവർക്ക്, "ജീവിതം മുഴുവൻ നിസ്സാരമായൊരു തമാശയായിരുന്നു. കഴിയുന്നേടത്തോളം കുടിക്കുകയും കഴിയുന്നേടത്തോളം കളിതുടരുകയും കഴിയുന്നേടത്തോളം പൊട്ടിച്ചിരിക്കുകയും ചെയ്യുക എന്നതായിരുന്നു അവരുടെ തത്വശാസ്ത്രം. പൊട്ടിച്ചിരിക്കൽ പൊള്ളയാണെന്നവർ മനസ്സിലാക്കിയിരുന്നു. ജീവിതം തന്നെ വെറും നീർക്കുമിളകൾ ആയിരുന്നു. ഊതിയാലതു പൊട്ടിത്തകരുന്നു.... അർത്ഥമില്ലാത്ത, ആശകളും അഭിലാഷങ്ങളുമില്ലാത്ത, ഉഷ്ണം കൊണ്ടു പുകയുന്നൊരു മരുഭൂമിയാണ് ജീവിതം. ആ ജീവിതത്തിൽ പൊള്ളയായ പൊട്ടിച്ചിരിക്കൽക്കാണു വിലയുള്ളത്" (132). ശിവൻ അന്യനും അപരിചിതനും പരാജിതനുമായിത്തീരുന്നതിന് നോവലിസ്റ്റ് പശ്ചാത്തലമാക്കിയിട്ടുള്ളത് നഗരത്തിലെ ഈ യാന്ത്രിക സംസ്കാരമാണ്.

കുടുംബസംരക്ഷണഭാരമാണ് 'ശിവനെ' നഗരത്തിലെത്തിക്കുന്നത്. സ്വന്തം താല്പര്യങ്ങളെ മാറ്റിനിർത്തിക്കൊണ്ടാണ് അയാൾ നഗരത്തിലെത്തുന്നത്. എന്നാൽ അയാൾ വളർത്തി വലുതാക്കിയ അനുജനും വിപ്ലവലഹരിയിൽ അയാളെ തള്ളിപ്പറയുന്നു. വിപ്ലവത്തിന്റെ ലഹരി ഉൾക്കൊണ്ടുകൊണ്ട് അനുജനായ കേശവൻകുട്ടി അയാളെ തള്ളിപ്പറഞ്ഞപ്പോഴാണ് ഇത്രയും കാലത്തെ തന്റെ ജീവിതത്തിന്റെ നിരർത്ഥകത ശിവനുൾക്കൊള്ളുന്നത്. അതുവരെ പാർട്ടിയുടെ പതനത്തിൽ തനിക്ക് യാതൊരു പങ്കുമില്ലെന്നു കരുതിയിരുന്ന ശിവൻ താനും ആ പതനത്തിനു



കാരണക്കാരനാണെന്നു തിരിച്ചറിയുന്നു. ഓരോ മനുഷ്യനും ജീവിതത്തിൽ തീവ്രമായ ശൂന്യതാബോധവും വ്യർത്ഥതാബോധവും അനുഭവിക്കുന്നു. അസ്തിത്വത്തെ സംബന്ധിച്ച അകാരണമായ ഉത്കണ്ഠ മനുഷ്യനെ നിരന്തരം വേട്ടയാടുന്നു. ഈ മാനസികാവസ്ഥയെ അസ്തിത്വവിഭ്രാന്തി എന്നു വിളിക്കാം. ഈ അസ്തിത്വവിഭ്രാന്തിയാണ് 'ശിവൻ' അനുഭവിക്കുന്നത്. സഫലമാകാത്ത കമ്മ്യൂണിസ്റ്റ് പ്രവർത്തനവും ജീവിതവീക്ഷണ വികലതകളും കുറ്റബോധവും മൂലം ശിവൻ ഒരു ഉന്മാദാവസ്ഥയിലാകുന്നു. വ്യർത്ഥമായ ജീവിതം പേരി ഏകനായി അലയുന്ന അസ്തിത്വനായകനെ ശിവൻ ഓർമ്മിപ്പിക്കുന്നു.

സമൂഹവുമായി പൊരുത്തപ്പെട്ട്, തന്റേതായ ഒന്ന് അതിൽ നൽകാൻ കഴിയാതെ പോകുമ്പോഴുള്ള മാനസിക സംഘർഷമാണ് സ്വത്വപ്രതിസന്ധിയുണ്ടാക്കുന്നത്. "എനിക്ക് വ്യക്തിത്വമില്ല. ഒരു വ്യക്തിയുടേതായ പ്രത്യേകതകളില്ല. ഗുണങ്ങളും ദോഷങ്ങളുമില്ല. എന്റെ ഗുണങ്ങളും ദോഷങ്ങളും ഈ നഗരത്തിന്റേതാണ്. യാന്ത്രികമായ ഈ നിലനില്പിന്റേതാണ്" (232) എന്നു പറയുന്ന ശിവൻ അനുഭവിക്കുന്ന മാനസിക സംഘർഷം സ്വത്വപ്രതിസന്ധിയുടേതാണ്. വ്യക്തികൾക്ക് സംഭവിക്കുന്ന ഒറ്റപ്പെടലാണ്, ഞാനാര്? എന്ന തോന്നലാണ് സ്വത്വപ്രതിസന്ധിയുണ്ടാക്കുന്നത്. ക്ഷണമിടമില്ലാത്ത ഈ നോവൽ അവസാനിക്കുന്നത് വർത്തമാനകാല യാഥാർത്ഥ്യത്തിന്റെ പൊള്ളത്തരം തിരിച്ചറിഞ്ഞതിനെത്തുടർന്ന് നഷ്ടപ്പെട്ടുപോയ സ്വപ്നത്തെ യാഥാർത്ഥ്യമാക്കാൻ ശ്രമിക്കുന്ന കഥാനായകന്റെ അവസ്ഥ ചിത്രീകരിച്ചുകൊണ്ടാണ്. ദൽഹിയിലെ തെരുവുകളിലൂടെ തെരേസ്സയുടെ പേരുരുവിട്ടുകൊണ്ട് ഭ്രാന്തമായി അലയുന്ന ശിവനെ നാമിവിടെ കാണുന്നു. "അവൻ സ്കൂട്ടറിൽനിന്നിറങ്ങി ബസ്സോപ്പിൾനിന്ന സ്ത്രീകളുടെ സംഘത്തിനടുത്തേക്ക് നടന്നുചെന്നു.... 'തെരേസാ! അവൻ നിലവിളിച്ചു. നിങ്ങളിലാരാണ് തെരേസാ! ഒരുപക്ഷേ ആളങ്ങു മാറിക്കൊണ്ടും കണ്ടാലറിയാത്തപോലെ മാറിക്കൊണ്ടും. അവരാരും മിണ്ടിയില്ല" (254). സ്വത്വം നഷ്ടപ്പെടുന്നതോടെ വ്യക്തി തനിക്കുതന്നെ അപരിചിതനായിത്തീരുന്ന അവസ്ഥയിൽ (self - estrangement) എത്തുന്നു.

ആദർശാത്മകലോകം സ്വപ്നം കണ്ടിരുന്ന ശിവന് കുടുംബത്തിനുവേണ്ടി നഗരത്തിലേക്ക് തന്റെ ജീവിതം മാറ്റേണ്ടിവരുന്നു. എന്നാൽ നാഗരികതയുടെ സ്വഭാവങ്ങളുമായി താരതമ്യം പ്രാപിക്കുവാനോ തന്റെ തനതുവ്യക്തിത്വം നിലനിർത്തുവാനോ ശിവനു കഴിയുന്നില്ല. ശൂന്യതയിൽനിന്നാണ് ഓരോ മനുഷ്യനും വരുന്നതെന്നാണ് അസ്തിത്വവാദികളുടെ നിഗമനം. അതുകൊണ്ടുതന്നെ പ്രവൃത്തികളിലൂടെ സ്വന്തം സ്വത്വം രൂപപ്പെടുത്താൻ ഓരോരുത്തരും

ശ്രമിക്കുന്നു. ശിവനും അങ്ങനെയാണ്. നാട്-നഗരം എന്നീ രണ്ടിടങ്ങളിലും ശിവന് വ്യക്തമായ ലക്ഷ്യങ്ങളുണ്ട്. എന്നാൽ ആ ലക്ഷ്യങ്ങൾ സാക്ഷാത്കരിക്കുവാൻ ശിവനു കഴിയുന്നില്ല. ആദർശനിഷ്ഠവും ആത്മാർത്ഥവുമായ ഒരു രാഷ്ട്രീയജീവിതമായിരുന്നു ശിവന്റെ ലക്ഷ്യം. അതിലൂടെ സ്വന്തമായൊരു വ്യക്തിത്വം സ്ഥാപിക്കുവാൻ ശിവൻ ശ്രമിക്കുന്നു. എന്നാൽ കുടുംബബന്ധത്തിന്റെ കെട്ടുപാടുകൾ ശിവനെ അതിൽനിന്നകറ്റുന്നു.

നഗരത്തിലേക്ക് ശിവനെത്തുന്നതും വ്യക്തമായ കാഴ്ചപ്പാടുകളോടെയാണ്. തന്റെ കൂടപ്പിറപ്പുകളേയും അമ്മയേയും സംരക്ഷിക്കുക എന്ന ഉത്തരവാദിത്വം ശിവനിലുണ്ട്. എന്നാൽ അവിടെ ജീവിതം വെറും യാത്രികമായി മാറുന്നു. നഗരത്തിൽ കാണുന്ന പൊയ്മുഖങ്ങളിലൊന്നാണ് തന്റേയും എന്ന് ശിവൻ തിരിച്ചറിയുന്നു. "തനിക്കിനി ഒന്നുമില്ല. ഒരുലക്ഷ്യമുണ്ടായിരുന്നു. അതു താൻ ഉപേക്ഷിച്ചു. ഇപ്പോൾ ജീവിച്ചിരിക്കുന്നത് മരിച്ചതിന് തുല്യമാണ്. ഓർക്കുമ്പോൾ പക തോന്നുന്നു. എല്ലാവരോടും എല്ലാറ്റിനോടും പക. ജീവിതത്തിന്റെ ഒരു ഭാഗവും തന്റേതായിട്ടില്ല. വിപ്ലവകാരിയാകാൻ പുറപ്പെട്ടു. ആ ലക്ഷ്യം നശിച്ചു. പിന്നീടൊരു യന്ത്രമായി പണിയെടുത്തു" (184). ഈ മാനസിക സംഘർഷം അവസാനം അനുജനായ കൃഷ്ണൻകുട്ടി 'റെനിഗേഡ്' എന്നു വിളിച്ചുകേൾക്കുന്നതോടെ പൂർണ്ണമാകുകയാണ്. ജീവിതത്തെ ഭയക്കുന്ന, സ്വത്വം നഷ്ടപ്പെട്ട ശിവനെ - ഏകനായ മനുഷ്യനെ - ആണ് നോവലിന്റെ അവസാനത്തിൽ നാം കാണുന്നത്. "അർത്ഥമില്ലാത്ത ജീവിതത്തിന് അർത്ഥം കൊടുത്തുകൊണ്ട് പൊള്ളയായ പൊട്ടിച്ചിരികൾ ആഞ്ഞടിക്കുന്നു" (167). നഷ്ടപ്പെട്ടുപോയ ആദർശങ്ങളും സ്വപ്നവും ജീവിതവും വീണ്ടെടുക്കുവാനാകാതെ ഒരു യന്ത്രം പോലെ ശിവന്റെ ജീവിതം നീങ്ങുന്നു. അയാളുടെ നോട്ടത്തിൽ സമൂഹം അയാൾത്തുമാണ്; സാമൂഹ്യസ്ഥാപനങ്ങൾ പലപ്പോഴും മിഥ്യയാണ്. സ്വാതന്ത്ര്യം കാംക്ഷിക്കുന്ന മനുഷ്യന് അവിടെ സ്ഥാനമില്ല. അഥവാ സ്വാതന്ത്ര്യം പോലും അർത്ഥശൂന്യമായിരിക്കുന്നു.

**ഉപസംഹാരം**

അസ്തിത്വവാദം ഒരു തത്വചിന്താപദ്ധതി (ട്രൂതോളിള ജവശഹീറീവു) എന്നതിനെക്കാൾ ജീവിതാവസ്ഥയുടെ ആവിഷ്കാരമാണ്. സ്വാതന്ത്രാനന്തരകാലഘട്ടത്തിൽ കടന്നുവന്ന കാനാടന്റെ ഉഷ്ണമേഖലയിൽ ദുർവിധികൾ ജീവിതനിഷേധമായി മാറുന്നത് കാണാൻ

കഴിയും. മുഖ്യങ്ങൾ നഷ്ടപ്പെട്ട ആധുനികലോകത്തിൽ അസ്തിത്വം തേടിയലയുന്ന, ഒറ്റപ്പെടുന്ന മനുഷ്യരുടെ അവസ്ഥകളെയാണ് ഈ നോവൽ പറഞ്ഞുവയ്ക്കുന്നത്.

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## A REVIEW OF FINANCIAL INCLUSION AND MSME SECTOR

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### Abstract

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MSME (Micro, Small and Medium Enterprise) sector has emerged as a very vibrant and dynamic sector of the Indian economy. Over the last few decades it not only play significant role in providing employment at low cost of capital but also towards economic growth, balanced regional development and poverty reduction. Even after sixty years of independence majority of population still remained unbanked which lead to exclusion of population from banking sector and other financial services. This leads to financial instability. As a measure the RBI and the ministry of MSME began to emphasize the idea of financial inclusion. Financial inclusion is the process of ensuring access to financial services and adequate timely credit by low income groups and weaker sections at an affordable cost. This study analyses the role of banking sector in bringing financial inclusion in MSME sector. For this, data are collected from the secondary sources. Being the primary lender, banks play a big role in bringing the excluded units within the fold of formal banking.

**Keywords:** MSME, financial inclusion

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### Introduction

Financial inclusion is the delivery of financial services at affordable cost to vast section of the disadvantaged and low income group. Or it broadly means universal access to a wide range of financial services at affordable cost. These

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include not only banking products but also other financial services such as insurance and equity products. The policy makers have been focusing on financial inclusion of rural and semi urban areas primarily for three needs:

- A) Creating a platform for inculcating a habit to save money.
- B) Providing formal credit avenues
- C) Plugging gap and leaks in public subsidies and welfare program .Now we shall discuss the financial inclusion and MSME sector.

MSME sector (Micro, Small and Medium enterprises) is the strong pillar of Indian economy and they are the engine of growth. MSME also known as Town and Village Enterprise. They are mainly skill oriented. Now there are 26 millions micro medium enterprises unit in our country. It is the second largest provider of employment. Around 16 million people are employed in this sector. It contributes 45% to manufacturing output and 40% to nations export .its contributions to Gross Domestic Product(GDP) is also noticeable i.e. 7.04 %(2012-2013) so we can see the significance contribution of MSME sector in economic growth, employment generation, balanced regional development overall poverty reduction and socioeconomic development etc.

### **Objectives**

1. To analyze the measures taken by the banking sector to promote MSME sector.
2. To understand the contributions of MSME sector towards the economy.

### **Methodology**

The data required for the study has been collected from secondary sources. This includes Annual reports of Ministry of MSME and Government

of India. Various Websites, Articles and journals connected with relevant topics of MSME.

## **Result**

In accordance with Micro, Small Medium enterprise development (MSMED) act 2006, MSME are classified into:

1. Manufacturing/production of goods
2. Providing/rendering of services.

Manufacturing enterprises have been defined in terms of investment in plant and machinery (excluding land and building) and further classified into:

1. Micro enterprises- investment up to ₹ 25 lakhs
2. Small enterprises-investment about ₹ 25 Lakh and up to ₹ 5 crore.
3. Medium enterprises' investment above 5 cores and up to ₹ 10 crore

The service enterprises have been defined in terms of their investment in equipment (excluding land and building) and further classified into:

1. Micro enterprises-investment up to ₹ 10 lakh.
2. Small enterprises investment above 10 lakh and up to ₹ 2 crore.
3. Medium enterprizes –investment above ₹ 2 crore and up to ₹ 5crore.

When a small enterprise is concerned, the major source of finance is from banking sector but they faces many problems in acquiring finance from many banks because of their inability to pledge adequate collaterals. Because of this many of the people in the rural areas are not able to enjoy banking and other financial services. This emphasizes the importance of financial inclusions i.e. banking unbanked. Even though there are evidences that MSME sector contribute prominently towards the Indian economy, it faces many problems like

- a) Lack of infrastructural input and banking support.
- b) Low rate of investments
- c) Lack of suitable technology
- d) Inefficient marketing strategies

All these problems arise because of lack of capital. RBI has taken measures to ensure sufficient credit availability to MSME sector. All the domestic commercial bank should lent 40% of their Adjusted Net Bank Credit (ANBC) to MSME sector. We know the bank loans to MSME are eligible to be classified under priority sector advances. It provide finances, which can be classified as

1. Direct finance
2. Indirect finance.

Direct finance are given to manufacturing enterprises, food and agro processing units, service enterprises, export credit ,Khadi and Village Industries sector on the other hand indirect finance are given to financial institutions (which will in turn reach MSME sectors) and to the persons involved in the decentralized sector i.e. supply and marketing of outputs of artisans, village and cottage industries.

In order to ensure that correct credit is available to micro enterprises within the MSME sector, banks should ensure that 40% of the total advances to MSME sector should go to micro(manufacturing) enterprise where the investment is up to ₹ 10 lakh and to micro (service) enterprises where investment is ₹ 4 lakh and 20% of total advances to MSME (manufacturing ) sector where investment is ₹ 10 lakh to ₹ 25 lakh and to micro (service) sector where investment is 4 lakh to 10 lakh. Therefore a total of 60% of the MSME advances will go to the micro enterprise. Banks are mandated not to accept

collateral security (in case of loans up to ₹ 10 lakh) from the units of MSME sector. But on the basis of good track record and financial position, extend of credit limit of loan may be up to 25 lakh.

Some of the banking sector supports are as follows:

- **Scheme of small entrepreneurs financial centers**  
The scheme has been introduced in consultation with ministry of finance, Government of India, SIDBI, banking division, Ministry of SSI(Small Scale Industries). It enabled to expand outreach of banks and also for improving credit flow to this sector.
- **Composite loan**  
A loan limit of 1 crore to be sanctioned to avail working capital and term loan requirement.
- **Structured MSME branches**  
Public sector banks have been advised to open at least one specialized branch in each district. This will enable the entrepreneurs to have easy access to bank credit to MSME sector.
- **Structured mechanism for monitoring credit growth to MSME sector**  
Indian Banks Association led a subcommittee to monitor the credit related issues to this sector.
- **A state Level Inter Institutional Committee (SLIIC)**  
SLIIC have been setup in all states. It closely monitors timely sanction of working capital to units which have been provided by SFC.



- Empowered committee on MSME

This committee will meet periodically and review the program in MSME financing and rehabilitation of MSME units. It also coordinates the banks and financial institutions and state government of India in removing bottlenecks and ensures smooth flow of credit to this sector.

- Credit linked capital subsidy scheme

This scheme has been made more attractive by raising the ceiling on loans from 40 lakhs to 1 crore and by raising rate of subsidy from 12% to 15%.

- CGTMSE(Credit Guarantee Fund Trust For Small Medium Enterprises)

Credit Guarantee Fund Trust for Micro and Small Enterprises” was introduced by Government of India in consultation with SIDBI to make available collateral free credit to the Micro and Small Enterprise sector.

Apart from these services bank also gives:

- Business advisory services
- Short term insurance
- Invoice discounting
- Capacity building through SME seminar
- Matching local SME with foreign supply
- Financial planning and management services

Public sector banks are advised to double the follow of credit to MSME sector. Because of their support MSMEs have become one of the vibrant and dynamic sector in the Indian economy Lets have a look in to its contributions to Employment and Gross Domestic Product (GDP) (Table 1).

**Table1. Contribution of MSME to employment and Gross Domestic Product (GDP) of India**

Sl.No.	Year	Employment (Lakh)	GDP
1	2009-10	921.79	7.49
2	2010-2011	965.15	7.42
3	2011-2012	1,011.80	7.28
4	2012-2013	1,061.52	7.04

## Conclusion

MSME sector provides dedicated SME department or units to provide customaries financial service. From the annual reports we can see SME accessing loans from banking has increased (60%) and Loan disbursement also has increased. Credit flow has reached ₹15387crore and Contribution to GDP is 7.04% (2013). Contribution to Total export is also commendable i.e. 42.38% (2013) and towards Employment is 1061.52lakhs (2013).So we can conclude that the MSME sector has performed well and it is able to resolve many of the problems facing by MSME which leads to reduced rate of financial exclusion in this vibrant sector.

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[www.cgtsi.org.in](http://www.cgtsi.org.in)

## **FINANCIAL LITERACY- A TOOL FOR FINANCIAL INCLUSION IN THE FINANCIAL SECTOR OF WAYANAD DISTRICT OF KERALA**

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### **Abstract**

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Financial inclusion is the process of ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost in a fair and transparent manner by mainstream institutional players. Financial inclusion has become one of the most critical aspects in the context of inclusive growth and development. Financial literacy centres are basic units which are set up to carry out financial literacy activities. Financial literacy aids in improving the quality of financial services and contribute to economic growth and development of a country. The study strives to find out the role and impact of financial literacy centres (FLC) as a tool for financial inclusion by the banks of Kerala. The concept of financial literacy has gained widespread attention, however its effectiveness as a tool for financial inclusion has never been analysed before. So the present study focuses on the extent and the impact of financial literacy centres in the Wayanad district of Kerala during the quarter ending on March 31<sup>st</sup>, 2015. The study is based on the secondary data collected from the reports of the State Level Banking Committee, commercial banks and from the various journal articles.

**Keywords:** Financial Literacy, Financial Literacy Centre(FLC), Financial Inclusion

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## **Introduction**

Financial inclusion is the process of ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost in a fair and transparent manner by mainstream institutional players. Financial literacy aims at educating and improving the informed decision in the usage of the various financial products and services available in the market. Thus financial literacy acts as an important adjunct for promoting financial inclusion. Thus the first step towards financial inclusion is financial literacy which eventually leads to sustainable growth and development.

This financial literacy could be achieved through the active participation of the Financial Literacy Centres (FLC) which aims to impart financial literacy in the form of simple messages like Why Save, Why Save early in your Life, Why Save with banks, Why borrow from Banks, Why borrow as far as possible for income generating activities, Why repay in time, Why insure yourself, Why Save for your retirement etc. The FLCs ensures that misselling of financial products and services does not take place. In fact, they spread they play a pivotal role in spreading financial services to an increased mass of population.

Over the recent years, financial landscape has changed considerably in our country. Financial landscape has become complex over the past few years with the introduction of many new financial products. In order to understand risk and return associated with these products, a minimum level of financial literacy is a must. Financial literacy aids in improving the quality of financial services and contribute to economic growth and development of a country.

Financial Literacy is an important adjunct for promoting financial inclusion, an integrated approach is adopted, wherein the efforts towards

financial inclusion and financial literacy go hand in hand. Through financial literacy and education, information on the general banking concepts is disseminated to diverse target groups, including school and college students, women, rural and urban poor, pensioners and senior citizens to enable them to make informed financial decisions. To ensure that the initiatives on the supply side are supported by initiatives on the demand side, nearly 800 financial literacy centres are set up by banks. In addition to this, the infrastructure created at the state level is leveraged, comprising of State Level Bankers Committee (SLBC) at the apex which is ably supported by the Lead District Managers (LDMs) at the District level. A mass scale Financial Literacy Program is designed with an objective to integrate the financially excluded population with low level of income and low literacy level with the formal financial system. Financial Literacy Centres organize outdoor literacy camps which are spread over a period of three months and delivered in three phases wherein along with creating awareness, accounts are also opened in the literacy camps. The program has been received well on the ground as an integrated approach of financial inclusion through creating awareness and providing access simultaneously.

A survey was conducted amongst 516 salaried individuals of Himachal Pradesh concludes that overall financial literacy level of 58.30% among all respondents is not encouraging (Bhushan and Medhury 2013). Study conducted in the state of Tamil Nadu concluded that the financial literacy level is low among the respondents and they also suggested various methods for the Banks to enhance the financial literacy level among the public (Shankari *et al.*, 2014). Results of the analysis conducted in the females of Mumbai city, Maharashtra revealed that most of the females in the city do possess certain kind of financial security, but they are still financially illiterate (D'Silva *et al.*, 2012).

The State of Kerala shows much potential for an emerging Financial Knowledge Society in India. The State is leading India in this respect, it has to go further by making more banking penetration in order to financially enrich the marginalized sections of the society in the State. In the spreading of these modern technology based banking products and services, the Financial Literacy Centres have to play a pivotal role by creating awareness (John *et al.*, 2013).

### **Significance of the study**

Financial literacy is considered as an important factor that promotes financial inclusion. Due to the importance of financial literacy, Reserve Bank of India and Central Government are undertaking many projects and programmes to make the people financially literate. Even then many of the individuals are unfamiliar with even the most basic economic concepts needed to make sensible saving and investment decisions. This has serious implications for saving, retirement planning and other financial decisions. In this scenario a study that covers these issues will be significant. So the present study focuses on the extent and the impact of financial literacy centres in the Wayanad district of Kerala. Wayanad district is selected because it is a tribal area and it stands first in the case of adivasi population when compared to other districts of Kerala.

The public sector banks in the district include Corporative Bank, Union Bank, Syndicate Bank, Punjab National Bank, Canara Bank, State bank of India, State Bank of Travancore, South Indian Bank, Vijaya Bank. Whereas the private sector banks in Wayanad includes Federal Bank, Dhanalakshmi Bank, Catholic Syrian Bank, Axis Bank Ltd, HDFC Bank. North Malabar Gramin Bank is the Regional Rural bank of Wayanad. They carry out measures for financial inclusion in different dimensions as per the RBI guideline; however this study is focused on the financial literacy camps carried out by the banks.

## **Objectives**

- The study tries to study the extent and the impact of financial literacy camps conducted by the banks in the Wayanad district.
- The study also makes a comparative study between the financial literacy camps of private sector banks and public sector banks in the Wayanad district.

## **Methodology**

The present study is designed as an analytical study. The necessary data was collected from secondary sources and the analysis was done using descriptive tool like percentages.

## **Result**

Output of financial literacy initiatives conducted by private sector and public sector banks in the district of Wayanad, Kerala is provided in table 1.

### **Federal Bank**

The only private bank who has taken the initiative for financial literacy centres (FLC) in the Wayanad district is the Federal Bank. In fact, it was the first bank to set up the FLC in the district in the year 2010. The bank has conducted the highest number of camps when compared to other banks. And also have covered the highest number of participants through its initiatives. The target population included majorly those without the bank accounts. The results from such camps marked to be effective as all of them who attended the camps opened the bank accounts at the end. Thus the bank was successful in conducting the financial literacy camps.

### **Canara Bank**

The bank has conducted the least number of financial literacy camps in Wayanad, however has covered a fair number of participants through its camps



during the quarter. The effectiveness of the camps is highly critical as there is a remaining 36% who remains without a bank account even after undergoing the literacy camp.

### **State Bank of Travancore**

The bank has not covered as much population as the Federal Bank or the Canara Bank. When compared to other banks it has the least coverage of participants. From among the population covered, 87% of them had a bank account prior to the camp. Another 12% opened up an account after the camp, there is still 1% of the population who has not yet opened an account, which questions the effectiveness of the camps conducted by the bank.

### **State Bank of India**

The bank has conducted 10 camps and has covered an average of 12 people through each of these camps. However, 54% of those who attended the camp were found to have opened an account with the bank after the camp and the other 32% already had a bank account even before participating in the camp. Perhaps the effectiveness of the camps is critical as 14% of those who attended the camp have still not opened an account.

### **Conclusion**

Wayanad, a district having a low level of literacy rate in the state is also doomed to be a financially illiterate area. Federal Bank is the only private bank to take up such financial literacy initiatives for the financial inclusion of the population. Perhaps the momentum of State Bank of Travancore (SBT) and State Bank of India (SBI) are weak in the present scenario. Canara Bank, the Lead Bank of the State was weak in its effectiveness in carrying out the financial literacy initiatives; however has better population coverage when compared to the other private banks. Though there are 5 private banks, 9 public sector banks and 1

Regional Rural Development bank in Wayanad, only 1 out of 5 private banks and 3 out of 9 public sector banks have taken a step forward to the financial literacy measures like financial literacy centres (FLCs) in the district. Hence Private sector bank has a better overall contribution towards financial Inclusion when compared to that of public banks. Financial literacy is the first step towards financial inclusion and financial inclusion is an indispensable step towards sustainable development and growth. The FLCs activities in the Wayanad district have covered 3,891 people through 66 camps it conducted during the year quarter as on March 2015. Given the diverse demographic nature of the district, the reach of the activities needs to further expand to cover the unreached population. Here comes the role of financial literacy as a tool of financial inclusion.

**Table 1. Financial Literacy Centres of the private sector and public sector banks and its output in the Wayanad District, as on September 2015 (Quarterly Report) SLBC Report, 2015**

Name of the bank	No. of literacy camps undertaken	No. of persons participated in literacy camps	Out of persons participated, persons already having the bank accounts		Out of persons participated, persons started bank accounts after the camp		Persons not having bank accounts even after the camp.	
			No.	%	No.	%	No.	%
<b>Private Sector Bank</b>								
Federal Bank	43	3108	1604	52%	1504	48%	Nil	0%
<b>Public Sector Banks</b>								
Canara Bank	5	503	225	45%	95	19%	183	36%
State Bank of Travancore	8	163	142	87%	19	12%	2	1%
State Bank of India	10	117	37	32%	63	54%	17	14%
Total	23	783	404	51%	177	23%	202	26%

### **Scope for further research**

Given the diversified demography of population, there is an untapped mass who are not accessed to the financial services. The banks have an opportunity that remains undiscovered, at the same time there also certain concerns hindering these banks like profitability and size of the bank. These variables need to be identified and studied to make financial literacy as an effective tool for financial inclusion in the financial sector of Wayanad district.

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## DIGITAL FINANCIAL INCLUSION INITIATIVES IN INDIA

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### Abstract

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Financial inclusion is about the broadening of financial services to those people who do not have access to financial services sector, the deepening of financial services for people who have minimal financial services; and greater financial literacy and consumer protection so that those who are offered the products can make appropriate choices. Financial firms can join hands to build a technology-enabled financial sector that can reach every nook and cranny of India, and even across borders, to foster growth. Technology is the key for financial inclusion as it can reduce costs significantly and reach the masses. However, all technologies are not suitable for financial inclusion due to issues pertaining to affordability, accessibility, security and privacy. ICT can help realize multiple business objectives – such as reducing cost of achieving financial inclusion to enhancing productivity and efficiency levels of such an intermediation to even better managing business risks. However, given a long gestation period in introducing technology in any existing process, the even longer learning curve (that often involves unlearning as well) and huge capital investments required for it, implies that ICT infrastructure enablement for sustainable financial inclusion needs to be a well thought out strategy. IBA and IDRBT have to play a major role in synchronizing the different requirements of the Banks and provide the technological solutions within a time frame. This paper is an attempt to throw light on the technological initiatives in fulfilling financial inclusion objectives and the approach and status of computerization at different levels.

**Keywords:** Financial Inclusion, Technology

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## **Introduction**

The correlation between financial inclusion and economic growth has long been widely recognized: low financial inclusion impedes economic growth. Access to easy and affordable credit by the disadvantaged social groups is acknowledged as a key criterion for poverty alleviation and reducing social inequity. However despite broad international consensus on the importance of access to finance as a powerful poverty alleviation tool, it is estimated that over 2 billion people globally continue to be excluded from the formal financial sector. India with 135 million households is home to the second largest financially excluded population, after China. Given the size of the challenge and the heterogeneity of the financially excluded segment, there cannot be an approach or model which can be prescribed globally. Instead, models which are contextual to the local consumer requirements are required. Each stakeholder of the financial inclusion ecosystem including financial institutions, regulatory agencies, technology service providers, NGOs etc will need to play their part and more importantly collaborate with each other to design and implement effective interventions. ICT has a key role in enabling supply and demand side Interventions which can deliver affordable financial services at a scale and pace which the problem demands ([www.tcs.com](http://www.tcs.com)).

The Government of India, in concert with the Reserve Bank of India, has embarked upon the mission of fostering inclusive growth in the country through the process of financial inclusion by ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker sections and low-income groups at an affordable cost in a fair and transparent manner. The Banks continued to enthusiastically support and complement the nation's initiatives in this crucial socio-economic objective ([www.idbi.com](http://www.idbi.com)).

## Objectives

- To understand the technological initiatives in achieving financial inclusion
- To understand the role of banks in digitising financial inclusion

## Technological initiatives under financial inclusion

The **Internet and Mobile Association of India (IAMAI)** and **ItzCash Cards Limited** emphasized the need to accelerate and promote digital payments to ensure a fast paced shift from cash to a cashless economy. IAMAI has extended their complete support to the government to create a favorable environment to drive financial inclusion and said that its members will work out business models that are conducive to push digital payments growth ([www.indiainfoline.com](http://www.indiainfoline.com)).

The financial inclusion and efficiency gains associated with ubiquitous access to digital payments systems are very high. Digital payments can reduce transaction costs by up to 90 percent, save the Government more than ₹ 1 lakh crore and provide accessible financial services to all residents while also lowering costs for financial providers. This is especially salient in India where its sheer size and wide-spread absolute poverty does not allow for many to absorb the costs associated with the management of physical currency notes and traditional branches.

The RBI Committee on Comprehensive Financial Services (CCFS) thereby envisions a much greater proliferation of digital payment points, especially in rural areas, such that every resident in India would be within a fifteen minute walking distance. The Committee thus recommends the evolution of Pre-Paid Instrument Issuers (PPIs) into Payments Banks that can

leverage their existing networks and businesses, such as the sale of mobile airtime or postal products, to handle very small value transactions in an efficient, cost-effective, and secure manner. In addition, the Committee recommends the emergence of interoperable White-Label BCs with direct access to the settlement system to increase penetration in the country ([www.developmentoutlook.org](http://www.developmentoutlook.org)).

List of Recommendations by the ‘Committee on Comprehensive Financial Services for Small Businesses and Low Income Households’ included the following six vision statements:-

1. **Universal Electronic Bank Account (UEBA):** By January 1, 2016 each Indian resident, above the age of eighteen years, would have an individual, full-service, safe, and secure electronic bank account.
2. **Ubiquitous Access to Payment Services and Deposit Products at Reasonable Charges:** By January 1, 2016, the number and distribution of electronic payment access points would be such that every single resident would be within a fifteen minute walking distance from such a point anywhere in the country. Each such point would allow residents to deposit and withdraw cash to and from their bank accounts and transfer balances from one bank account to another, in a secure environment, for both very small and very large amounts, and pay reasonable charges for all of these services.
3. **Sufficient Access to Affordable Formal Credit:** By January 1, 2016, each low-income household and small-business would have convenient access to formally regulated lenders that have the ability to assess and meet their credit needs, and offer them a full-range of suitable credit products, at an affordable price. By that date, each



District and every significant sector (and sub-sector) of the economy would have a Credit to GDP ratio of at least 10 per cent. This ratio would increase every year by 10 per cent with the goal that it reaches 50 per cent by January 1, 2020.

4. **Universal Access to a Range of Deposit and Investment Products at Reasonable Charges:** By January 1, 2016, each low-income household and small business would have convenient access to providers that have the ability to offer them suitable investment and deposit products, and pay reasonable charges for their services. By that date, each District would have a Total Deposits and Investments to GDP ratio of at least 15 per cent. This ratio would increase every year by 12.5 per cent with the goal that it reaches 65 per cent by January 1, 2020.
5. **Universal Access to a Range of Insurance and Risk Management Products at reasonable Charges:** By January 1, 2016, each low-income household and small business would have convenient access to providers that have the ability to offer them suitable insurance and risk management products which, at a minimum allow them to manage risks related to: (a) commodity price movements; (b) longevity, disability, and death of human beings; (c) death of livestock; (d) rainfall; and (e) damage to property, and pay reasonable charges for their services. By that date, each District would have a Total Term Life Insurance Sum Assured to GDP ratio of at least 30 per cent. This ratio would increase every year by 12.5 per cent with the goal that it reaches 80 per cent by January 1, 2020.
6. **Right to Suitability:** Each low-income household and small - business would have a legally protected right to be offered only

suitable financial services. While the customer will be required to give informed consent she will have the right to seek legal redress if she feels that due process to establish Suitability was not followed or that there was gross negligence ([www.rbidocs.rbi.org.in](http://www.rbidocs.rbi.org.in)).

### **Digitized Government Payments in India**

In recent years, the central government of India and some state governments have begun transferring welfare and benefit payments directly into beneficiaries' bank accounts to ensure accountability, and safe and complete delivery of payments.

Among those who have received government payments in the last six months, 35 percent receive their payments via direct deposit to a bank account. While the majority of payments are received in full, 13 percent of government payment recipients report having to pay bribes to receive their payments.

InterMedia, Washington supported by Bill & Melinda Gates Foundation conducted a qualitative study with government-payment beneficiaries across four districts in the state of Maharashtra. The focus was on the central government's Direct Benefit Transfer (DBT) program and its potential to expand financial inclusion. Findings from this qualitative study include: – Digitized government payments have the potential to help drive greater use of digital financial services but challenges remain. Beneficiaries see advantages of using the DBT method to receive payments into their bank accounts, including fewer delays and full receipt of payment. But the process of switching to DBT needs to be easier and more efficient.

Awareness of digital financial services (DFS) is low, but many are interested in learning more about conducting electronic transactions, including

savings. The use of voice-based applications can help raise financial awareness among mobile phone owners with low literacy and low digital skills. Beneficiaries have to be incentivized to reduce payment cash-outs and to use linked digital products. Banks also need incentives to design and market products to DBT account holders: Interest-bearing savings products and bill payment services should be added onto beneficiary bank accounts to encourage digital financial services uptake ([www.finclusion.org](http://www.finclusion.org)).

### Adults in India with active digital accounts

Supported by the Bill & Melinda Gates Foundation, InterMedia, Washington, conducted an India-wide survey of 45,024 adults, ages 15 and older, from October 15, 2013, to January 8, 2014, to understand their financial behaviour and their access and use of digital financial services. Results of the survey show that the state of Maharashtra is having highest active digital accounts and the state of Bihar, the least (figure 1) while 32% of adults below poverty line in Himachal Pradesh enjoy the privilege of active digital accounts (figure 2).

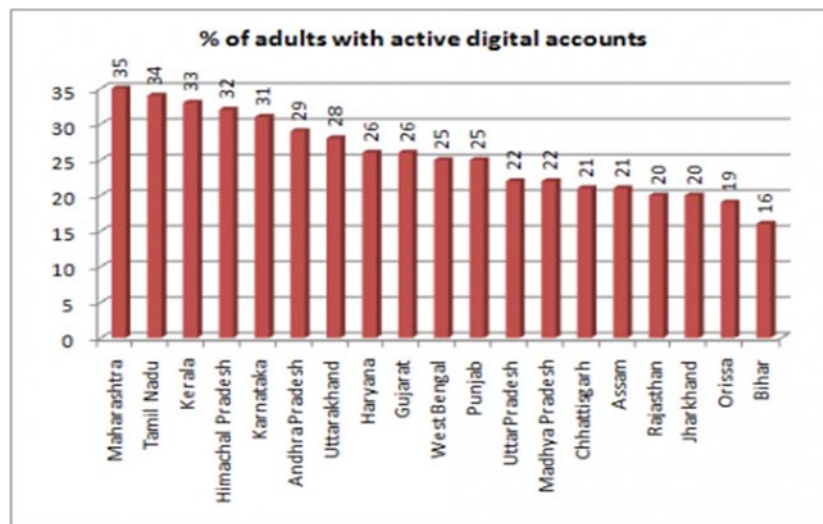
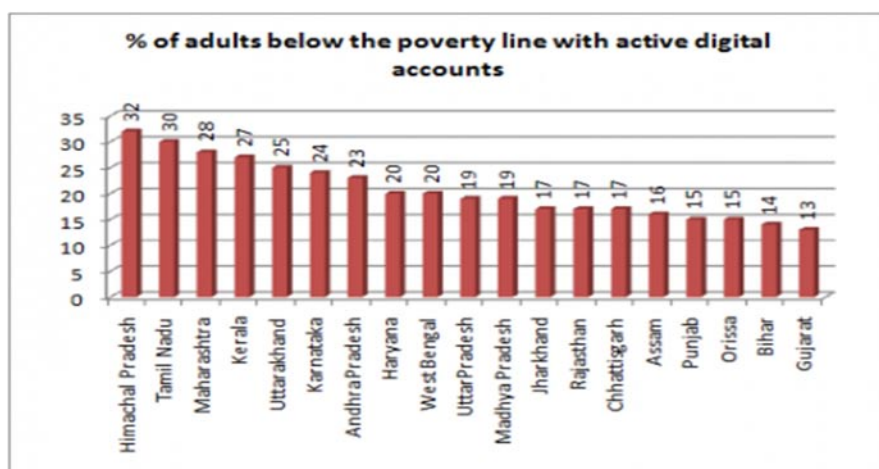


Figure 1. Financial behaviour of people below poverty line across different states in India and their access and use of digital financial services



**Figure 2. Financial behaviour of people below poverty line across different states in India and their access and use of digital financial services**

The study further says, “Even the group of active bank-account holders uses their accounts mainly for basic withdrawals and deposits. Very few use their bank accounts for receiving wages through direct deposit (9 percent), sending or receiving money from family (2 to 3 percent) or paying a utility bill (5 percent).” While agreeing that the Government of India’s financial inclusion policy has focused on increasing access to banking infrastructure, especially in rural areas, with 63 percent of new bank branches in the last five years having been set up in rural and semi-urban areas to ensure access to banking services, the study says, “Both rural women and men are far less likely to use their bank accounts actively than their urban counterparts (rural women – 42 percent, rural men – 52 percent; urban women – 53 percent and urban men 70 percent) (www.counterview.org).

### **Role of banks in digitizing financial inclusion**

Broadly, the following aspects need to be adequately addressed:

- 1) A uniform structure for enrolment of customers, conforming to extent KYC norms needs to be developed and followed by all the Banks for the purpose of Financial Inclusion.

- 2) Standards to be prescribed for the use of proximity/near field smart cards which are Inter operable in different devices.
- 3) A centralized hub/switch to be established on the lines of ATM switch for interfacing with the CBS systems of different Banks.
- 4) Service area approach should be adhered for extending financial inclusion with specific villages to be allotted to specific Banks.
- 5) Banks should endeavour to bring total prosperity and growth in the allotted villages, developing them into multiple and microeconomic hubs of modern India.
- 6) Qualification and Training of Business Correspondents (e.g.; similar to insurance agents)

## **Technological Requirements**

### **Centralized Hub**

A critical requirement for taking technology in the remote areas is integration and synchronization with the Core Banking System of respective Banks. Towards this end if IDRBT is able to host a centralised Financial Inclusion System depicted as the intermediary Transaction Processing System it would be of immense help to the industry due to the following reasons:-

#### **Benefits to customers:**

- 1) Access to banking facility in unconnected areas
- 2) Economical vis-à-vis personal visit to the branch
- 3) Availability of multitude of different banking products and services at their location
- 4) Enable microfinance disbursement

- 5) SHGs can be served at their doorstep. Presently a large number of SHGs are coming to branches daily, as they require routing their transactions through banks. Under the above model, banking services will be brought to their doorstep, saving time for SHGs.
- 6) Collection of fees in colleges/schools
- 7) Payment of pension at the residence of the pensioner
- 8) Payment of salary to employees at their company, factory, office etc.
- 9) Setting stalls in exhibitions, fair, outdoor locations etc. for catering to customer requirements

**Benefits to Banks:**

- 1) Expand reach of Bank's financial inclusion services for people in remote/unbanked locations
- 2) Enhance social responsibility of the Bank by way of taking technology to the common man
- 3) Economies of operation—Low transaction cost vis-à-vis branch based
- 4) Competitive edge in tapping untapped business potential
- 5) Building long-term relationship with customer, enhancing trust & loyalty towards Bank.

**All-purpose Single Card**

Presently, various types of cards are floated by various Banks. Debit Cards, Credit Cards, Kisan Credit Cards, Swarojgar Credit Card, Artisan Credit Card, Bhumiheen Kisan Card, Kisan Samadhan Card, Laghu Udyami Trade Card, etc. are some of the cards issued by various Banks. There is a felt need to replace these individual purpose specific cards to a single card containing all the possible features. The cards can be used for:

- 1) Providing Govt. benefits/subsidy/services to the customer
- 2) Getting the required information of the customers on his family
- 3) Making utility payments
- 4) Micro credit / micro insurance facilities
- 5) Card to contain the full particulars of the account holder with limits sanctioned/available, balance outstanding, photo, finger prints, etc. with provision for data updation and the unique citizenship number, if any allotted in future.
- 6) Cover working capital, consumption loan and OD Limits
- 7) Card should be operable both in online and offline systems  
([www.iba.org.in](http://www.iba.org.in))

### **Role of mobile banking in achieving financial inclusion**

A broad vision is developed for financial inclusion, where payments can be made easily through a mobile device or an electronic network. This visioning is used to bridge distances, contain settlement risks, close information gaps and reduce the transaction costs. Alam et al (2013) refers that mobile banking has a great potential to extend the financial services distribution to poor people as it lowers the delivery cost, encompassing costs both to banks for maintaining, building channels, for delivery and to users who access services. On the demand side, mobile banking will make the banking services and products and immediately accessible. On the supply side, mobile banking it will be cost effective; it will save costs of providing physical access that is mortar and bricks and become an economic proposition for banks to handle transactions based on small value made by the low-income citizens. Ivatury and Mas (2010) refer that concentrating on smaller banks and MFIs (Micro Finance

Institutions) face a much higher cost-of-delivery due to values of smaller transaction and the likely more dispersed and remote location of at least some of their consumers. Lyman et al (2008) and Yu (2009) point out that financial inclusion refers to the delivery of financial services at an affordable cost to the most sections of the low-income groups.

The customers can store, enter, process, transmit and display information through mobile banking. Mobile banking as the channel of branch banking will be more helpful to rural customers in saving the travelling encompassing precious time and money to visit the distant branches for money transaction and it is an appropriate delivery door-step banking model. Thus it is concluded that mobile banking helps to achieve the financial inclusion (Dhillon 2014).

The expansion of initiatives led not only by financial institutions, but by mobile service providers, and technology providers such as platforms, networks, and other institutions that are introducing innovative business models, alter the ecosystem of the industry with complex schemes and pose new challenges to regulators. Economic, regulatory and infrastructural differences within the financial system lead to each country having a particular ecosystem, which may not be replicable from one market to another.

## **Conclusion**

Apart from speedily connecting different parts of the country through digital bandwidth, we need innovative cost effective technology solutions leveraging the growing base of mobile devices, creating seamless connects between financial institutions leveraging common systems and technology investments and designing sound IT security systems as the number and complexity of transactions grow in the coming years. The concept of banks being physical entities to which people go to, for their needs of financial



transactions is already giving way to banks being virtual- anytime, anyplace which is being experienced by a small percentage of the country currently. Methods of lending and basis of access to credit and collaterals will also undergo a sea change with new business models emerging.

Financial institutions would be able to derisk themselves with real time data and forecast of revenue earnings of small businesses based on analytics of the parameters influencing sales, trends of buying patterns and business booking and thus operate with more transparent and tangible data for various size and seasonality of businesses. This phenomenon will explode in the coming years and financial institutions have to rethink their value propositions and cost of servicing customers and thus re-engineer their business to take advantage of financial inclusion and digital access. The faster the digital expansion process, the more successful would be the mission for financial inclusion.

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## **A STUDY ON THE IMPACT OF MISLEADING ADVERTISEMENTS ON TEENAGERS AND THEIR PARENTS IN KOCHI CITY**

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### **Abstract**

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The above study is an attempt to find out the impact of misleading advertisements on teenagers and their parents in Kochi city. The data required for the same is collected both from teenagers as well as from parents. The perceptions of both are taken into consideration to find out the impact of misleading advertisements. The study tries to find out how far the changes in demographics of teenagers and their parents change their perception on impact of misleading advertisements. The study proves that the perception and impact of misleading advertisements are the same across different demographics. Therefore it is a universal problem and needs special attention from the part of parents, educational institutions and the government to minimise its ill effects.

**Keywords:** Advertisements, Teenagers, Kochi

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### **Introduction**

Commercial pressures are a part of modern teenagers and its effects need careful examination. Teenagers represent an important demographic to marketers. This is because they have their own purchasing power, they influence their parents buying decisions and they are the adult consumers of future. Brand loyalties and consumer habits formed when young will be carried through to adulthood. Teenagers engrossed in consumer culture suffered more depression, anxiety and lower self esteem.

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The family is considered as the most important agent due to the frequency of interactions and close relation between the family members, also peers are considered important socialisation agents in particular during adolescence. This parent –teenager influence may be direct or indirect and it may not always be a conscious process. In short, both business and the economy are affected by the impact of marketing on teenagers in addition to their families.

### **Misleading Advertisements**

Conceptually deception exists when an advertisement is introduced into the perceptual process of some audience and the output of that perceptual process

- 1) Differs from the reality of the situation
- 2) Affects buying behaviour to the detriment of the consumer.

The input itself may be determined to contain falsehoods. The more difficult and perhaps more common case, however, is when the input, the advertisement, is not obviously false, but the perceptual process generates an impression that is deceptive. A disclaimer may not pass through the attention filter or the message may be misinterpreted.

According to Federal Trade Commission 1983, dividing the definition into its three major components, it states that deception will be found if-

- 1) There is a misrepresentation, omission or practice that is likely to mislead.
- 2) The consumer is acting responsibly (or reasonably) in the circumstances.
- 3) The practice is material and consumer injury is possible because consumers are likely to have chosen differently if there was no deception.

## **Misleading advertisements targeting teenagers**

There is nothing accidental in an ad. It is never “just a picture”. A team of marketing experts, including psychologists, put a lot of time, thought and money into commercial advertisements. Most often, products are pitched to make us believe that our perceived deficiencies can be overcome by buying a certain product.

All of an ad’s components are consciously created to try to make us think or feel a certain way, and to distract us from things that would deter us from buying that product.

It has been documented that the average teenager spends about 6 ¾ hours a day using media-television, movies, magazines, newspapers, playing videogames and using the computer. With our fast-paced society, teenagers are being left more on their own to make decisions that have a direct impact on families, and these decisions are often influenced by what advertising they see-through print, television, radio and internet.

Advertisers use strategies that are meant to manipulate specific consumer groups into wanting and buying more stuff. “Targeting Teens” is one such strategy. Teenagers are considered the country’s largest consumer demographic because teens often have disposable income, teens are thought to have disposable income or money that can be spent on luxury items or things they don’t really need because majority of them do not contribute to family essentials like food and rent. They are susceptible to peer pressure and “fitting in”. Teenagers greatly influence their peers and parents, establishing brand loyalty, or dedication to a certain brand, at a young age ensures that brand is bought for the rest of that teen’s life.

The CEA (Consumer Electronics Association) research says teens may be more open to impulse purchases because they tend not to overanalyse. They are less likely than others to compare prices or seek recommendations. They buy

based upon what their friends are buying, what will make them more popular with their peer group, or what a celebrity whom they admire or respect says they need. They are more insecure and more rebellious than people of any other age group. Advertisers are aware of this and desperately try to meet their fluctuating demand and they are succeeding. They know that teenagers' tastes will change on any given day- what is popular today can be passé tomorrow. Advertisers have found their niche with teenagers.

Teens don't have to be pawns of the advertising world. Knowledge of strategies that advertisers use can help teens be more aware of their choices and influence the market in meaningful ways. They need to be better informed about how and why they are being targeted and why it is essential for them to "choose" rather than be "chosen".

### **Advertisements and parents**

The advertisements targeting children bothers parents a lot. This is because a child demands what has been advertised irrespective of the merits of their demand. Well to do parents fulfil the demand of their children. However the economically backward parent finds it difficult to oblige to the demands made by their children. This leads to parent child conflict. The children do not understand the plight of their parents and resort to other ways of fulfilling their demand. Some parents in order to keep their children happy even takes loan, thus lingering themselves into the payment of loans. Parents also complain about the contents of an advertisement telecasted.

### **Objectives**

- 1) To find out the difference in perception of teenagers on misleading advertisements depending on their differences in demographics.

- 2) To find out the difference in perception of parents of teenagers on misleading advertisements affecting their teenage wards depending upon variation in their demographics.

## **Methodology**

Primary and secondary sources of data were used for the study. Secondary data was collected from books, journals, newspapers and e-resources. Primary data was collected through separate structured questionnaires distributed among teenagers and their parents.

Convenience sampling method was used for selecting respondents. Hundred teenagers and their parents in Kochi city were selected for the study.

The data collected were analysed using statistical tools and techniques such as percentages and ANOVA.

## **Results**

- 1) The buying and spending pattern of teenagers based on advertisements is not affected by their monthly disposable income
- 2) The factors in advertisements that attract teenagers do not depend upon their educational qualification.
- 3) The impact of misleading advertisements among different age groups is the same.
- 4) The perception of parents on impact of misleading advertisements on teenagers does not vary depending upon their educational qualification.
- 5) The impact of misleading advertisement on parents does not depend upon their income.
- 6) The impact of misleading advertisements among parents is the same irrespective of their occupation.



### Impact of misleading advertisements on teenagers

It has been identified through the study that there is no difference in the impact of misleading advertisements depending upon the disposable income, age, or education level of teenagers.

**Table 1. Relation between Monthly Disposable Income and buying and spending pattern of customers depending upon advertisements**

Monthly disposable income	Buying and Spending pattern of customers influenced by ads				
	Always	Often	Sometimes	Rarely	Total
Less than ₹ 2000	0 0.0%	18 34.0%	24 45.3%	11 20.8%	53 100%
₹ 2000-4000	1 7.1%	4 28.6%	5 35.7%	4 28.6%	14 100%
₹ 4000-6000	0 0.0%	5 38.5%	4 30.8%	4 30.8%	13 100%
₹ 6000-8000	0 0.0%	0 0.0%	2 100.0%	0 0.0%	2 100%
₹ 8000-10000	0 0.0%	0 0.0%	2 66.7%	1 33.3%	3 100%
₹ 10000 and above	0 0.0%	3 33.3%	5 55.6%	1 11.1%	9 100%
Total	1 1.1%	30 31.9%	42 44.7%	21 22.3%	94 100%

H1: The buying and spending pattern of teenagers based on advertisements varies with the variation in their disposable income.

**Table 1.1 Result of statistical analysis between Monthly Disposable Income and buying and spending pattern of customers depending upon advertisements**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	.778	5	.156	.259	.934
Within Groups	52.935	88	.602		
Total	53.713	93			

There is no significant difference ( $P>0.05$ ) (Table 1.1) between the disposable income of teenagers and their buying and spending pattern based on advertisements. In other words the buying and spending pattern of teenagers based on advertisements is not affected by their monthly disposable income or does not vary depending upon their monthly disposable income.

**Table 2. Relationship between the level of education of teenagers and the factors in advertisements that attract them**

Level of education	Factors in ads that attract teens				Total	
	Brand loyalty	Discount offers	Celebrity endorsements	Free gifts/ Coupons		
HighSchool	Count %	15 48.4%	7 22.6%	6 19.4%	3 9.7%	31 100.0%
Plustwo	Count %	17 32.7%	12 23.1%	15 28.8%	8 15.4%	52 100.0%
Degree	Count %	6 40.0%	4 26.7%	4 26.7%	1 6.7%	15 100.0%
Total	Count %	38 38.8%	23 23.5%	25 25.5%	12 12.2%	98 100.0%

H2: The factors in advertisements that attract teenagers vary depending upon their level of education.

**Table 2.1 Result of statistical analysis between the level of education of teenagers and the factors in advertisements that attract them**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.825	2	1.412	1.255	.290
Within Groups	106.940	95	1.126		
Total	109.765	97			

The table 2.1 clearly states that there is no significant relationship ( $P>0.05$ ) between factors that attract teenagers in advertisements and their educational qualification. The factors in advertisements that attract teenagers does not depend upon their educational qualification.

**Table 3. Relationship between age of teenagers and the impact of misleading advertisements on them**

Age		Effect of misleading ads on teenagers					Total
		Teenagers experiment harmful products	Materialistic values are created among teenagers	It encourages risky behaviour among teenagers	Teenagers are likely to get diverted from goals in life	It may even affect the health of teenagers	
13-15	Count	2	9	3	11	6	31
	%	6.5%	29.0%	9.7%	35.5%	19.4%	100.0%
15-17	Count	3	6	2	8	2	21
	%	14.3%	28.6%	9.5%	38.1%	9.5%	100.0%
17-19	Count	12	6	6	16	6	46
	%	26.1%	13.0%	13.0%	34.8%	13.0%	100.0%
Total	Count	17	21	11	35	14	98
	%	17.3%	21.4%	11.2%	35.7%	14.3%	100.0%

H3: The impact of misleading advertisements on teenagers varies depending upon their age.

**Table 3.1 Result of statistical analysis on the relationship between age of teenagers and the impact of misleading advertisements on them**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	2.660	2	1.330	.715	.492
Within Groups	176.687	95	1.860		
Total	179.347	97			

There is no significant difference ( $P > 0.05$ ) between the impact of misleading advertisements on teenagers and their difference in age (Table 3.1). The impact of misleading advertisements among different age groups is the same.

### Impact of misleading advertisements on parents of teenagers

It has been proved through this study that the impact of misleading advertisements on parents is the same irrespective of their level of income, educational qualification and occupation.

**Table 4. Relationship between parental perception of the impact of misleading advertisements and the educational qualification of parents**

₹		Effect of misleading ad on parents					Total
		Teenagers experiment harmful products	Materialistic values are created among teenagers	It encourages risky behaviour among teenagers	Teenager are likely to get diverted from goals in life	It may even affect the health of teenagers	
Under Graduate	Count	10	1	6	11	2	30
	%	33.3%	3.3%	20.0%	36.7%	6.7%	100.0%
Graduate	Count	11	4	7	19	3	44
	%	25.0%	9.1%	15.9%	43.2%	6.8%	100.0%
Post Graduate	Count	0	2	4	3	0	9
	%	0.0%	22.2%	44.4%	33.3%	0.0%	100.0%
Professional	Count	4	3	2	5	0	14
	%	28.6%	21.4%	14.3%	35.7%	0.0%	100.0%
Others	Count	0	1	0	0	0	1
	%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
Total	Count	25	11	19	38	5	98
	%	25.5%	11.2%	19.4%	38.8%	5.1%	100.0%

H4: The parental perception of the impact of misleading advertisements on their teenage children varies with the educational qualification of parents.

**Table 4.1 Statistical analysis of relationship between parental perception of the impact of misleading advertisements and the educational qualification of parents**

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	3.181	4	.795	.451	.772
Within Groups	164.095	93	1.764		
Total	167.276	97			

There is no significant relation ( $P > 0.05$ ) between the level of education of parents and their perception regarding the impact of misleading advertisements on their teenage children (table 4.1).

**Table 5. Relation between monthly income of parents and the impact of misleading advertisements on them**

Monthly Income		Effect of misleading ads on teenagers				Total
		Forced to spend beyond their means	Teenagers influence family purchase decisions	It may lead to parent child conflict	Likely to imitate celebrities in advertisements	
Less than ₹20000	Count	10	4	12	4	30
	%	33.3%	13.3%	40.0%	13.3%	100.0%
₹20000-40000	Count	16	4	10	3	33
	%	48.5%	12.1%	30.3%	9.1%	100.0%
₹40000-60000	Count	6	3	2	1	12
	%	50.0%	25.0%	16.7%	8.3%	100.0%
₹60000-80000	Count	3	1	3	0	7
	%	42.9%	14.3%	42.9%	0.0%	100.0%
₹80000 and above	Count	3	3	0	0	6
	%	50.0%	50.0%	0.0%	0.0%	100.0%
Total	Count	38	15	27	8	88
	%	43.2%	17.0%	30.7%	9.1%	100.0%

H5: The impact of misleading advertisements on parents varies depending upon their income

**Table 5.1 Statistical analysis between monthly income of parents and the impact of misleading advertisements on them**

	<b>Sum of</b>	<b>Df</b>	<b>Mean</b>	<b>F</b>	<b>Sig.</b>
Between	4.883	4	1.221	1.103	.361
Within Groups	91.833	83	1.106		
Total	96.716	87			

There is no significant difference ( $P > 0.05$ ) between income level of parents and the impact of misleading advertisements on them (Table 5.1)

**Table 6. Relation between occupation of parents and impact of misleading advertisements on them.**

<b>Occupation</b>		<b>Effect of misleading ad on parents</b>				<b>Total</b>
		<b>Forced to spend beyond their means</b>	<b>Teenagers influence family purchase decisions</b>	<b>Parent child conflict</b>	<b>Imitate celebrities in advertisements</b>	
Business	Count%	6	4	8	1	19
	WithinOccupation	31.6%	21.1%	42.1%	5.3%	100.0%
Professional	Count%	2	0	1	0	3
	Within Occupation	66.7%	0.0%	33.3%	0.0%	100.0%
Govt employee	Count%	15	3	11	2	31
	WithinOccupation	48.4%	9.7%	35.5%	6.5%	100.0%
Private employee	Count%	14	7	10	5	36
	WithinOccupation	38.9%	19.4%	27.8%	13.9%	100.0%
Others	Count%	2	0	0	0	2
	Within Occupation	100.0%	0.0%	0.0%	0.0%	100.0%
Total	Count%	39	14	30	8	91
	WithinOccupation	42.9%	15.4%	33.0%	8.8%	100.0%

H6: The impact of misleading advertisement on parents varies depending upon their occupation.

**Table 6.1 Statistical analysis between occupation of parents and impact of misleading advertisements on them.**

	<b>Sum of Squares</b>	<b>Df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
Between Groups	3.637	4	.909	.808	.524
Within Groups	96.825	86	1.126		
Total	100.462	90			

There is no significant difference ( $P > 0.05$ ) between occupation of parents and impact of misleading advertisements on them (Table 6.1)

## **Discussion**

The results of the study prove that there is no difference in the perception of parents on the impact of misleading advertisements on them and their teenage wards with the variation in demographics.

The result of the study also indicates that there is no difference in the perception of teenagers regarding the impact of misleading advertisements on them depending upon their demographics.

In short it can be concluded that the perception of teenagers and their parents regarding misleading advertisements does not depend upon their demographics.

## **Conclusion**

It is clear from the above study that impact of misleading advertisements is a universal problem. In fact, the effect of it on teenagers and their parents is the same irrespective of their demographics.

The impact of misleading advertisements on teenagers is studied based on their opinion regarding misleading advertisements, the factors in advertisements that affect them and the result of these on their behaviour and life. It is proved from this study that teenagers are aware of misleading advertisements, what it is, how they are targeted by advertisers and why they are targeted by them. They are also aware of the positive and negative effects of advertisements. Therefore it is possible to minimise the negative effects of advertisements by educating the teenagers and utilising their time and energy for productive purposes. This can be done by parents, educational institutions and the government.

Similarly, the impact of misleading advertisements is the same on all parents irrespective of their income, educational qualification and occupation. The parental perception regarding misleading advertisements and its effects on them and their teenage wards are the same irrespective of their variation in demographics. Parents are also aware of misleading advertisements and its negative effects on their teenage wards and ultimately on them. So, it is their responsibility to train their children at a young age regarding deception in advertising, to identify the same and to take rational decisions in their future life.

It can be concluded that even though the impact of misleading advertisements is more on teenagers and their parents, this problem cannot be viewed in isolation. It is a social problem that affects the future of our young generation and therefore the government and the society at large should take necessary steps to minimise its negative effects. The advertisers themselves should practice some degree of self-regulation as part of their corporate social responsibility and the government should monitor the same and correct it by imposing penalty on advertisers resorting to such malpractices.



It is necessary to build up a society that concentrates on social values rather than materialistic values, that tries to create an identity by their valuable contributions to the society rather than through consumption habits and thus build a future generation that contributes to the growth of the society and the economy.

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## NEED AND IMPORTANCE OF DNA BARCODING: CURRENT STATUS IN GENUS *PHEIDOLE* WESTWOOD IDENTIFICATION

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### Abstract

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Ants are currently identified based on the morphological characters. In future the traditional trend of using morphological characters may be replaced. In the genus *Pheidole* Westwood there are two castes in worker caste- major worker and minor worker. For understudied taxa in understudied areas, the ability to differentiate newly arriving ants from those of an unknown local fauna is limited. The technique of DNA barcoding can be used in species identification. A region of the mitochondrial gene *COI* (cytochrome c oxidase subunit I) is used for barcoding. The current article provides an insight towards the aspect of DNA barcoding in *Pheidole* ant species of Family Formicidae.

**Keywords:** *Pheidole*, Barcoding, Formicidae

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### Introduction

Ants are highly specialized, eusocial organisms. The genus *Pheidole* is generally known as big headed ants and is the largest of all genera of plants and animals (Wilson 2003) in the world. It belongs to the tribe Pheidolini and of Subfamily Myrmicinae. With 1,002 extant species this genus represents the highest species in world (Antweb 2015). This genus as a whole is distributed

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worldwide in the tropics and warm temperate region (Brown 2000) and is one of the prevalent ground dwelling genera in the tropics (Ward 2000). *Pheidole* Westwood possesses dimorphic worker castes that are composed of big headed major worker subcaste (soldiers) and minor worker subcaste. They are able to survive in adverse conditions since they collect and store seeds as food resources. Mostly they nest on soil surface and behind leaf litters. They are abundant in New World than in Old World Tropics. Regarding the great diversity of ants and its importance, the taxonomic works on ants in India is not much developed. On the contrary, the number of ant species recognized as threatened is higher than in other insects (IUCN 2008), but we have a poor understanding of the global biodiversity and distribution of ants. Due to its size and distribution, *Pheidole* Westwood is a very difficult genus and has been a challenge to myrmecologists taxonomically as well as biologically.

The increasing loss of biodiversity presents a daunting challenge to taxonomists. DNA barcodes allow the rapid identification of functional units of diversity that can scale to the magnitude of hyperdiverse arthropods at a timeframe needed by conservation groups responding to habitat destruction and degradation. If the ant species from an area have been DNA barcoded, even without assigning scientific names (Smith and Fisher 2009), the barcodes of future ant collections can be compared to the DNA barcode library of the adjacent mainland area. Such faunistic comparisons can be made with any kind of tissue, rather than requiring tissue from a particular morph or life stage (Smith and Fisher 2009)

### **Identification of Genus *Pheidole* Westwood**

*Pheidole* is considered as hyperdiverse genus of ants. They are distinguished by their discrete major and minor workers. Despite its hyperdiversity, the

taxonomy of this globally distributed ant genus is limited to important revisions for the New World and several Asian faunas. Wilson's (2003) treatment of the New World species and other more recent taxonomic and phylogenetic studies have brought some much needed clarity to defining the boundaries of many species. However, *Pheidole* of the Afrotropical zoogeographic region has never been revised. The most recent Afrotropical *Pheidole* species descriptions are fifty years old and many are considerably older. Identification keys are not available and many species descriptions are of limited diagnostic value (Fisher et.al, 2012).

We could identify 13 species of *Pheidole* from different parts of Kerala based on the morphological characters. The identification was mainly done using morphological features such as sculpture pattern, hairs and colour. It is a very difficult genus for identification. The identification was mainly based on major worker caste. In the absence of major worker caste it would be a problem in species identification. So DNA barcoding might be useful in species identification, to supplement morphologically based identification.

### **Status of DNA barcoding in genus *Pheidole* Westwood**

DNA barcoding in genus *Pheidole* (Formicidae: Myrmicinae) was carried out by Ng'endo et.al (2013). They sequenced 47 ants of the genus *Pheidole* (Formicidae: Myrmicinae) collected in the Brazilian Atlantic Forest to test whether the morphology-based assignment of individuals into species is supported by DNA-based species delimitation. However, few studies attempt to compare the results of these molecular studies with a more traditional species delineation approach based on morphological characters.

They isolated the Mitochondrial DNA Cytochrome oxidase subunit 1 (CO1) gene, sequenced, and measured 636 base pairs, from 47 ants of the

Brazilian Atlantic Forest to test whether the morphology-based assignment of individuals into species is supported by DNA-based species delimitation. They identified twenty morphospecies. Barcoding analysis identified 19 Molecular Operational Taxonomic Units (MOTUs). Fifteen out of the 19 DNA-based clusters allocated, using sequence divergence thresholds of 2% and 3%, matched with morphospecies. Both thresholds yielded the same number of MOTUs. Only one MOTU was successfully identified to species level using the CO1 sequences of *Pheidole* species already in the Genbank. The occurrence of distinct mitochondrial lineages within morphological species highlights groups for further detailed genetic and morphological studies, and therefore a pluralistic approach using several methods to understand the taxonomy of difficult lineages is advocated.

### **Need and importance**

Ant identification keys are biased strongly towards worker ants and other stages are very difficult to identify (Yoshimura and Fisher 2007; Fisher and Smith 2008). For understudied taxa in understudied areas, the ability to differentiate newly arriving ants from those of an unknown local fauna is limited; DNA barcoding may be the most reliable current method (Smith and Fisher 2009). DNA barcoding help in species comparison analysis. It also provides the discovery of new species, when the small portion of insects is obtained.

DNA barcoding is useful in the area when the voucher specimen with a known barcoded sequence to match with the unknown sample. This helps rapid identification of species. In case of Formicidae there are worker caste, queens and males and some genus have more than that. They are morphologically different from each another and this method helps to access the species status

and identification. In traditional method each species/ individuals would have measurements and description based on the morphology, which is time consuming. While DNA barcoding method allows to find the interesting individuals in right way (Fischer and Smith 2008). This will be extremely important as many biodiversity inventories are ongoing or coming to a close in the near future.

“Nothing can replace the countless hours of careful observation necessary to understand variation and to delimit species boundaries. However, the addition of sequence data provides a means to create short-term results from inventories and at the same time generate data helpful to taxonomists, sequencing highlights the specimens most deserving of focused study” (Fisher and Smith 2008)

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## THE ROLE OF COPROPHAGOUS BEETLES ON DUNG DECOMPOSITION IN A TROPICAL AGROHABITAT

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### Abstract

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The dung pat decomposition in agriculture fields of Kerala was examined during post monsoon months of 2015 using cow dung pats. To assess the role of dung beetles in dung decomposition Sixteen pots comprising four replicates were constructed and left uncovered, or using fine mesh nets to exclude dung beetles. After fourteen days these pats were retrieved from the field and the percentage of decomposition of the dung was determined. In pats in which dung beetles were allowed free access, dung disappearance was significantly faster when compared to pats from which dung beetles were excluded. When dung was freely exposed to dung beetles 75% of the organic matter was found to be removed within fourteen days whereas dung degradation was around 65% in dung beetle excluded pats. The results show that that the exclusion of dung beetles following deposition of dung causes a significant reduction the rate of decomposition. Therefore, in agricultural ecosystems the reduction of coprophagous beetle populations most likely has cascading and long-term effects throughout the ecosystem.

**Keywords:** Dung decomposition, Dung beetles

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## **Introduction**

India has the largest cattle inventory in the world and the estimated dung production for cattle is 4.5 kg/head/day (Ravindranath et al., 2005). Dung beetles in the insect family Scarabaeidae is considered to have the potential to transform this pollutant into nutrient resources (Bornemissza 1970, Waterhouse 1974, Fincher 1981). They play an important role in nutrient cycling in agriculture fields, by the removal and burial of dung from the surface to the soil, in the form of food for their young (Fincher 1973). Dung beetles exhibit many forms of nesting behaviour, including dwelling (endocoprid), rolling (telecoprid), and tunneling (paracoprid) (Halffter and Edmonds 1982).

Our understanding of dung beetles' role in soil fertility comes exclusively from pasture and grassland studies, and the importance of these processes is poorly understood for other systems. Further research is needed in tropical moist ecosystems, where dung beetles are typically capable of transferring all deposited mammal faeces into the soil within hours after deposition (Arrow, 1931; Slade et al., 2007).

Recent decline of dung beetles in urban and cropland mosaic of Haryana in Northern India (Mittal 2005), and the resulting fall in their eco-function in nature, made it imperative to look into our agricultural practices. Though, tropical warm moist weather conditions is ideal for the survival of dung beetles which result in high diversity of dung beetles not much scientifically monitored studies have been one in dung decomposition pattern and nutrient cycling in India. Only scientific studies done in field conditions could demonstrate the effect of these beetles in dung decomposition and nutrient cycling pattern. With increasing fertilizer prices, management practices that increase the efficiency of nutrient use and cycling on agricultural land are essential for the future

profitability from these lands. In this scenario, it is good to look into efficiency of naturally available waste/dung recycling organisms and how important they are in maintaining or increasing the soil fertility of agricultural ecosystems. In addition to releasing nutrients, these organic fertilizers break down and improve the structure of the soil and increase its ability to hold water and nutrients when compared to expensive chemical fertilizers which destroy the friability of the soil and also the rich and diverse life that exists in the soil. The objective of this study was to find out the efficiency of tropical dung beetle species in removing dung in the tropical natural ecosystems.

### **Study Habitat**

The experimental studies to quantify the effects of coprophagous beetles on dung decomposition were set up in open agricultural fields in Kerala during 2015. Experiment was carried out in the semi urban areas of Ernakulam district (*viz.*, Aluva and Muvattupuzha) in the Kerala state ( $10^{\circ} 00' N$  &  $76^{\circ} 15' E$ ). Vegetation of the area consists predominantly of rubber, coconut and cocoa plantations with intervening grasslands used for cattle grazing. Annual temperature of the area ranged from  $24^{\circ} - 35^{\circ}C$  and relative humidity from 40-80 %. Average rainfall in the area amounts to 1000-1500mm/year. Experiment was set up mainly in the intervening months between the two monsoons *viz.*, southwest and northeast monsoons.

### **Methodology**

To determine the rate of dung pat degradation, pots (height = 30 cm, diameter = 20 cm) were filled with silty loam soil (sand = 36.5%, silt = 53.4%, clay = 10.1%). Batches of pats of fresh cow dung of 800 gm weight were provided on to the top of the soil. 16 pots comprising four replicates of each of two treatments (dung + natural dung beetles and control (dung + no dung

beetles) were set up in the field. All the pots were exposed to natural field conditions (including sunlight, rainfall and wind). To estimate the amount of dung decomposed, the remaining dung piles were weighted after 14 days drying them at 100°C for five days (Sanchez *et al.*, 2004).

## Results and discussion

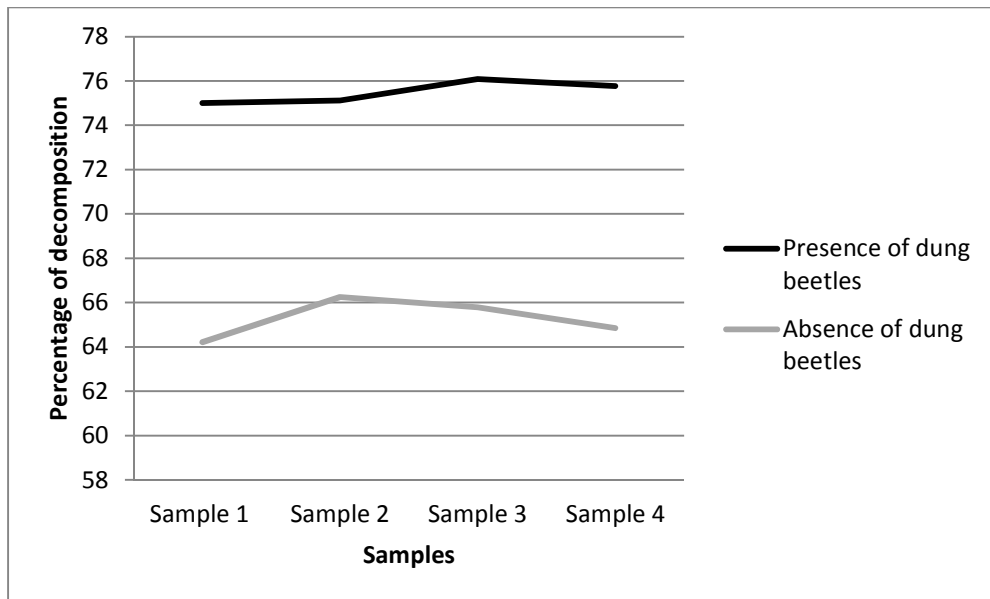
When dung was freely exposed to dung beetles 75% of the organic matter was found to be removed (Table 1; figure 1). In studies conducted by Holter 1979 it was found that 20-25% of the organic matter was removed in a span of 11-14 days. Tropical climate with high humidity must have contributed to the increased activity of dung beetles in the study habitat. When the dung was left alone with microorganisms the dung decomposition was found to be slow. Significant difference was noted between the two set of treatments ( $P < 0.05$ ).

In the freely exposed dung treatments, tunnelling dung beetle species was found to be the dominant ones and their presence might have increased the rate of desiccation by increasing aeration. Their activity also resulted in the mixing of the soil with organic matter but more research on nutrient analysis is required in the study habitat.

Studies done by Mittal 1993 has observed the effect of burrowing activity of tunnellers on the soil and Bang *et al.*, 2005 has noted that the soil permeability can be increased with tunnelling beetles in the top 10 cm of soil. Field studies also reported that the contribution of the large tunnellers in dung removal was significantly higher compared to the other groups of coprophagous beetles (Slade *et al.*, 2007). This result clearly demonstrated the importance of dung burial activity by dung beetles. Therefore, in agricultural ecosystems the reduction of coprophagous beetle populations most likely has cascading and long-term effects throughout the ecosystem (Klein 1989; Larsen *et al.*, 2005).

**Table 1. Decomposition of dung in the presence and absence of dung beetles during the study period**

Sl. No.	Samples	Weight of dung deposited (gms)	Presence of dung beetles			Absence of dung beetles		
			Weight of dung (gms) after 14 days of degradation	Mean Weight (gms)	Percentage of decomposition	Weight of dung (gms) after 14 days of degradation	Mean Weight (gms)	Percentage of decomposition
1	Sample 1	800	200	200 ± 15.47	75	300	286 ± 17.96	64
2			180			260		
3			210			290		
4			215			295		
5	Sample 2	800	180	198.8 ± 16.52	75	270	270 ± 21.21	66
6			190			315		
7			215			300		
8			210			275		
9	Sample 3	800	200	191.3 ± 15.48	76	290	273 ± 19.73	66
10			170			250		
11			190			265		
12			205			290		
13	Sample 4	800	185	193.8 ± 11.09	76	270	281 ± 16.52	65
14			190			290		
15			210			300		
16			190			265		



**Figure 1. Percentage of decomposition of dung in the presence and absence of dung beetles during the study period**

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## AN INVESTIGATION ON THE ANTIMICROBIAL EFFICIENCY OF LIQUID DISHWASHERS AGAINST PATHOGENIC BACTERIA

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### Abstract

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Food borne illnesses are increasing at an alarming rate today. Unhygienic practices and conditions are the key reason for this. Dishwashing detergents play a vital role in disease control. As a result markets are flooding with such products. This study evaluated the antimicrobial efficiency of three selected dish detergents (Dettol-Dish gel, Pril-Utensil cleaner concentrate, Homemade sample) using disc diffusion method. The test strains used in this study include *Escherichia coli*, *Staphylococcus aureus*, *Salmonella typhi* and *Bacillus cereus*. Results showed that Gram negative bacteria were more resistant when compared to Gram positive strains. Undiluted Dettol was found to be most effective agent against all the tested pathogens. It was also noticed that the efficiency of dish detergents were dependant on the concentration of the sample and the type of microorganisms used for the study. The overall results showed that no single dish detergent was completely efficient against all the strains. So, the development of better antimicrobial products is important in ensuring better community health.

**Keywords:** Liquid Dishwashing agents, Food borne pathogens, Dettol, Pril, Antibacterial activity

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## Introduction

Food borne infections are on the rise all over the world. Pathogens can be transferred to food from utensils that are not properly cleaned and sanitized. Since some pathogenic microorganisms can survive outside the human body for considerable periods of time, unsanitized utensils could be a direct or indirect source of food borne illnesses (Food Code 2001). A 2003 US Food and Drug Administration (FDA) report on the occurrence of food borne illness risk factors in retail food establishments mentioned the need for improvement in the sanitization process for food contact surfaces (FDA 2004).

It is usual practice in food production and service that food for human consumption that has been dropped onto unsanitary surfaces should be discarded. However, there is a perception by the general population that if food is dropped and picked up very quickly from an unsanitary surface, the food may not be too contaminated to consume (Sefton 2003). Food contact surfaces have the potential to act as reservoirs for bacteria over extended time periods, and they have been shown to transfer pathogenic bacteria to food (De Wit et al., 1979; Humphrey et al., 1994, 2001; Chen et al., 2001; Gorman et al., 2002; De Cesare et al., 2003; Kusumaningrum et al., 2003; Moore et al., 2003; Rayner et al., 2004). An estimated 76 million cases of food borne illnesses occur annually in the United States, of which 5200 are fatal (Mead et al., 1999). Few of the common bacterial pathogens causing food borne illnesses include *Staphylococcus aureus*, *Bacillus cereus*, Enterotoxigenic *E.coli* (ETEC), Enterohemorrhagic *E.coli* (EHEC): *Salmonella typhi*, *S.paratyphi* A, B and C.

The recent entry of products containing antibacterial agents into healthy households has escalated from a few dozen products in the mid-1990s to more than 700 today. Antibacterial products were developed and have been successfully used

to prevent transmission of disease-causing microorganisms (Levy 2001). Antimicrobial cleaning product can be defined as any material used for cleaning or disinfecting surfaces in general work environments. They are normally water solutions of different surfactants that might be acidic, alkaline or neutral depending on their use. Antimicrobial agents have become an indispensable part of modern life as they are used on a daily basis in nearly all workplaces and homes. Such products include detergents, disinfectants bleaches etc (Quirce et al., 2010).

Antibacterial agents are critical in the prevention of bacterial infections. However, after years of overuse and misuse of these products, bacteria have developed antibiotic resistance, which has become a global health crisis. The relatively recent increase of surface antibacterial agents or biocides into healthy households may contribute to the resistance problem (Levy 2001).

Much attention has been given to the public health aspects of dishwashing in large establishments whereas comparatively little attention has been given to the domestic problem. Since liquid dishwashes designed for domestic purposes are now coming into use, it is necessary for an evaluation from the public health standpoint that scientific information is obtained concerning their effectiveness in removing bacteria from contaminated dishes. Therefore the purpose of this investigation is to determine, under controlled laboratory conditions, the efficiency of different dish detergents.

## **Materials and Methods**

### **Test Organisms**

The test organisms used in this study were *Staphylococcus aureus*, *Bacillus cereus*, *Escherichia coli* and *Salmonella typhi*. These strains were maintained in the Microbiology laboratory of the Institution.

Three dishwashing agents used in this study were Homemade sample, Dettol (Dish gel) and Pril (Utensil cleaner concentrate). Homemade sample was prepared at home from ingredients available in the market. Dettol (Dish gel) and Pril (Utensil cleaner concentrate) are two dishwashing agents commercially available. Concentrated (X) and doubly diluted (1/2 X) samples of dishwashing agents were employed in this investigation

### **Antibacterial Susceptibility Assay**

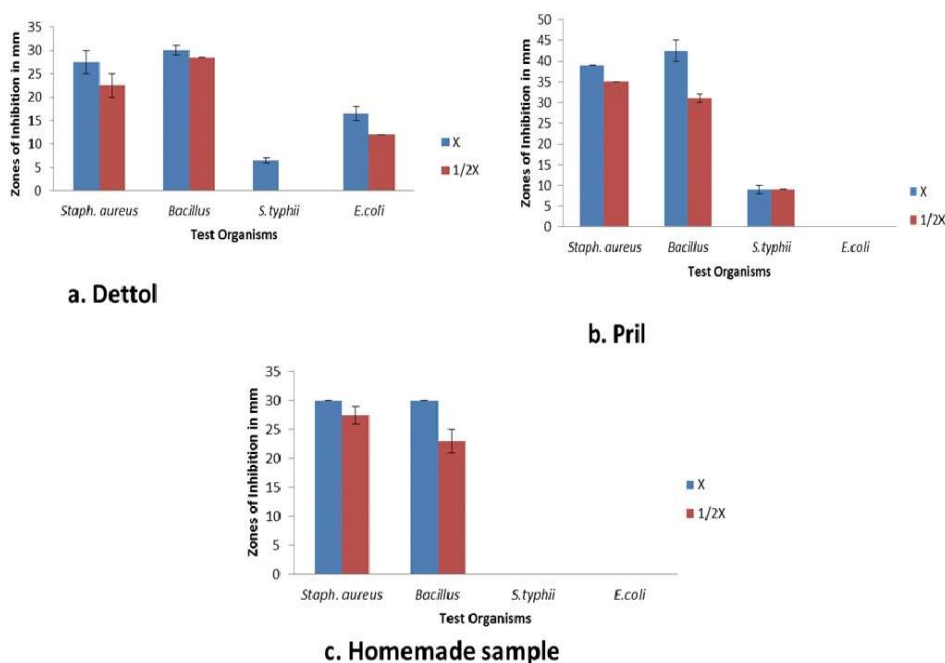
The susceptibility of the test strains to the dishwashes was tested using disc diffusion method. Test cultures were inoculated into Peptone broth and incubated for 2-3 hour. The Mueller Hinton plates were labelled and swabbed with the test culture. The sterile Whatman filter paper discs impregnated with the dishwashing solutions (concentrated (X) and doubly diluted (1/2 X)) were placed equidistantly on the swabbed plates. Filter paper discs impregnated with isopropanol and sterile distilled water served as positive and negative controls respectively. The plates were then incubated at 37<sup>o</sup> C overnight. The diameter of zones of inhibition were measured in mm and recorded.

### **Results and Discussion**

The public is being bombarded with ads for cleansers, soaps, dishwashing detergents, hand lotions all containing antibacterial agents. These agents also claim to be highly effective. However the results of the present study showed that no single dish detergent was completely efficient against all the pathogen. Erbilir (2003) too noted that regular dish washing liquid was not effective in reduction of bacteria in the house hold using.

The present investigation revealed that antimicrobial activities of tested dish detergents were concentration dependant with the efficiency of the agents decreasing with increase in dilution (Figure1). These findings support the

results of the work conducted by Awodele et al., (2007) and Riaz et al., (2009). Advertisements of most of these products available in shops claim that even a small amount of the dishwashing liquid is enough to remove all the dirt and germs from the utensils. So, they advise us to use diluted samples. But the present study shows that even at 100% concentration, some dishwashing agents were not able to provide protection against certain organisms particularly Gram negative bacteria.



**Figure 1. Antibacterial activity of liquid dish washes**

When tested by disc agar diffusion method, it was found that at undiluted (X) Dettol dish wash was effective against all the 4 pathogenic strains; exhibiting a broad spectrum of activity, unlike Pril and Homemade sample (Table 1). However the diameter of zones of inhibition of Pril was greater than Dettol and Homemade samples. Studies conducted by Selvamohan and Sandhya (2012) compared the antimicrobial efficiency of different soaps

like Dettol, Medimix, Savlon etc. In their study Medimix proved to be highly efficient and Dettol showed relatively lower zones of inhibition.

**Table 1** Antimicrobial activity of concentrated (X) dishwashing agents against test organisms

Dishwash detergent	Zones of inhibition (mm) of Test organism			
	<i>Staphylococcus aureus</i>	<i>Bacillus</i>	<i>Salmonella typhi</i>	<i>Escherichia coli</i>
Dettol dish wash gel	27.5 ±2.5	30±1	6.5 ±0.5	16.5±1.5
Pril	39±0	42.5±2.5	9±1	Nil
Home made sample	30±0	30±0	Nil	Nil

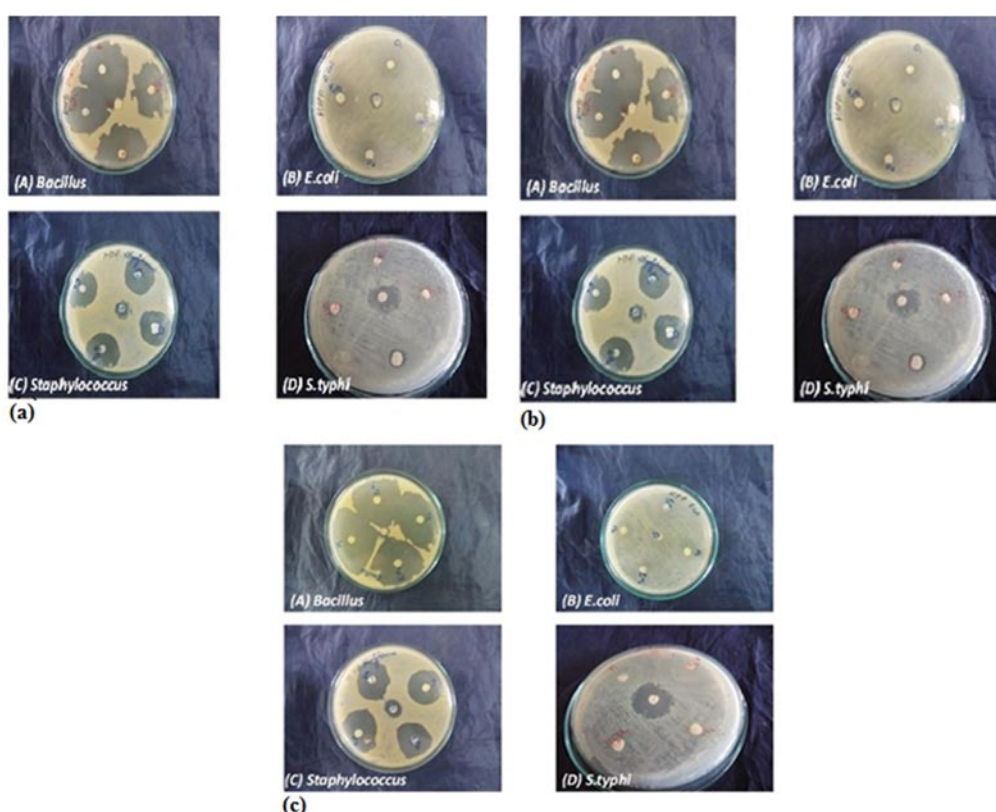
At 50% (1/2X) concentration the efficiency of all the three samples were found to be reduced. At this concentration, *S.typhi* was found to be resistant to both Dettol and Homemade sample whereas *E.coli* showed resistance against Pril and Homemade sample (Table 2).

**Table 2** Antimicrobial activity of diluted (1/2X) dishwashing agents against test organisms

Dishwash detergent	Zones of inhibition (mm) of Test organism			
	<i>Staphylococcus aureus</i>	<i>Bacillus</i>	<i>Salmonella typhi</i>	<i>Escherichia coli</i>
Dettol dish wash gel	22.5 ±2.5	28.5±1.5	Nil	12±0
Pril	35±0	31±1	9±0	Nil
Home made sample	27.5±1.5	23±2	Nil	Nil

It was noticed that among the pathogens, the highest degree of resistance was exhibited by *E.coli* followed by *S.typhi*. *E.coli* was even resistant to the concentrated samples of Pril and Homemade detergents (Figure 2 a, b and c). It was also noticed that Gram negative bacteria showed greater resistance to the dish detergents than Gram negative. This may be because of the specific differences in their cell wall composition. Mutations are also known as key

factors contributing to the emergence of resistance. It is clear from this study that efficiency of dish detergents was found to vary with the bacterial strain involved. Kusumaningrum et al. (2002) in their study on the effect of an antibacterial dishwashing liquid on *E. coli*, *S. enteritidis*, *S. aureus* and *B. cereus* too made similar observations. In the suspension tests *S. aureus* and *B. cereus* were susceptible to low concentrations of antibacterial dishwashing liquid (0.5%), whereas *E. coli* and *S. enteritidis* maintained their initial numbers for at least 24 h at 25°C. Lee et al. (2007) researched on the efficiency of manual dishwashing conditions on bacterial survival on eating utensils. They found out that the efficiency of the product is greatly determined by dish washing temperatures / time, organic matter, sanitizing condition and bacterial type.



**Figure 2.** Antimicrobial activities of (a) Dettol (b) Pril (c) homemade sample on different microbes

The present screening reveals that there is a need to develop more effective dish washing products to ensure the betterment of community health. This area of research requires much attention because the quality of such products is very important as they are the need of every household.

## Conclusion

The results obtained in this study revealed that none of three dishwashing detergents was able to provide complete protection against the selected pathogens. The efficiency of these agents was found to be depend on the type of bacteria and concentration of the solution used. Gram negative bacteria were found to be more resistant than Gram positive. *E.coli* exhibited the highest degree of resistance. This comparative study on the antimicrobial activity of liquid dish washing detergents proves that the agents that we use today are not completely efficient and the worst part is that the excessive use of such products are triggering the emergence of resistant strains. This could be a key reason for the increase in rate of food borne illnesses. So the development of much safer and efficient products has become the need of the hour.

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**Research Articles** (not exceeding 4000 words) should be the results of original, unpublished research work in various academic disciplines.

**Review articles** (not exceeding 4000 words) are expected to survey and discuss current developments in a field.

**Short Communication** (not exceeding 2000 words) are brief accounts on projects undertaken. They should include a brief abstract and an introductory paragraph

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The manuscript should be ordered as follows: Title page, abstract, key words, text, acknowledgements, references, figure and table legends, figures and tables. All manuscripts should be typeset in MS Word (Font: Times New Roman; Size: 12 points) double-spaced with at least 1" margin from all sides. Manuscript pages should be serially numbered.

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### **Journal article**

Amann RI, Ludwig W, Schleifer K-H (1995) Phylogenetic identification and *in situ* detection of individual microbial cells without cultivation. *Microbiological Reviews* 59: 143 – 165

### **Book**

Bull AT (2004) *Microbial diversity and bioprospecting*. ASM press, New York

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Cartwright J (2007) Big stars have weather too. IOP Publishing PhysicsWeb. <http://physicsweb.org/articles/news/11/6/16/1>. Accessed 26 June 2007

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